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For the Radcliffe Library, Oxford,
From the Council of the College.
Edm. Belfour

DESCRIPTIVE CATALOGUE

OF THE

PATHOLOGICAL SPECIMENS

CONTAINED IN

THE MUSEUM

OF

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

VOLUME I.

GENERAL PATHOLOGY.

LONDON:
PRINTED BY WILLIAM CLOWES AND SONS,
DUKE STREET, STAMFORD STREET.
1846.

PREFACE.

THE Council of the College published in 1830 a Catalogue of the Pathological Portion of the Hunterian collection in Two Parts, of which the First contained the descriptions of the preparations in spirit, the Second, those of the dried preparations. The descriptions of the former were collected by Mr. Clift from two very imperfect Manuscript Catalogues or Lists left by Mr. Hunter, in the handwriting of Mr. Bell and other amanuenses, and from inscriptions on the preparations themselves. Such alterations of these descriptions as seemed essential to clearness, and some additions to them, were made by Sir B. C. Brodie and Mr. Clift, under the direction of Sir Everard Home. The specimens were arranged by Mr. Clift nearly according to the plan adopted in the Hunterian Catalogues—a task of great difficulty, in consequence of the confusion in which Mr. Hunter left this portion of his Museum, and the frequent absence of any indication of the specimens for which the names or descriptions in the Catalogue were intended.

The descriptions of the dried specimens, which are comprised in the second part of the Catalogue printed in 1830, were written by Mr. Clift—no account of these having been preserved, with the exception of a few memoranda inscribed on the specimens themselves, or on sketches of them.

The number of specimens described in the published catalogues was 1709. To these have been added, by donations, about 600; and the number purchased from the Museums of Sir Astley Cooper, and of Messrs. Brookes, Heaviside, Liston, Langstaff, Taunton, Howship, and Walker, amounts to 1208.

The additions being thus more numerous than the original collection, the Council considered that it was not desirable to separate any longer the Hunterian specimens,* or to maintain unchanged the arrangement of which Mr. Hunter left so incomplete a sketch, and in accordance with which it would have been impossible to classify the additions to the Museum. They therefore determined that a new catalogue should be printed, which should include the descriptions of all the specimens in this portion of the College Museum, as well the Hunterian as those which have been added since the Hunterian Collection was placed in the charge of the College.

In the beginning of 1842 the Council resolved "That the preparation of the Pathological Catalogue be intrusted to Mr. Stanley, with authority to employ such assistance as he may think fit."

In accordance with this resolution Mr. Stanley engaged the assistance of Mr. Paget, Lecturer on General and Morbid Anatomy and Physiology at Saint Bartholomew's Hospital. These gentlemen, after a careful examination of the Collection, proposed the following plan of arrangement, which, drawn up by Mr. Paget, was submitted to the Council and adopted by that body in July, 1844.

" It is proposed that the Catalogue should, as heretofore, be printed in two distinct portions, one comprising the descriptions of all the specimens preserved in the cases on the floor of the Museum, and the other the descriptions of those preserved in the galleries; the descriptions in both portions being arranged, as far as possible, on the same plan. The first portion will relate wholly to dry preparations; the second, to the preparations preserved in the moist state, and the few dry preparations which for various reasons are placed among them.

" In the arrangement of the specimens it is proposed, after the example of Mr. Hunter, to place in a *first division* a certain number of preparations illustrating the general principles of pathology. The specimens proper to be placed in this division may be estimated at 300; and the Museum is sufficiently large to admit of this arrangement without in any degree detracting from the completeness of the series in the other division. They will be selected without particular regard to the seat of disease; many of them will be those which were intended by Mr. Hunter to be thus placed; others, taken from the additions to the Hunterian Collection, will be such as most strikingly illustrate the principles of pathology,—such as may be considered typical specimens of diseased structures; and others will be specimens of such diseases as affect at the same time several parts, or cannot, on other grounds, have a peculiar locality assigned to them, and therefore cannot properly be placed in any of the following series. These will be arranged as illustrations of the ascertained facts relating to the repair and reproduction of injured and lost parts; the effects of common inflammation; the characters of tumours and of various morbid growths and deposits; one or two specimens being selected for the demonstration of each diseased condition.

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* In the Museum, the Hunterian preparations are distinguished by black numbers, those from other sources bearing red ones; and in the Catalogue, to the descriptions of the former the word *Hunterian* is added.

" After this division, it is proposed that the rest of the preparations, including more than nine-tenths of the whole collection, should constitute a *second division*, arranged in several *series* according to the tissue or organ which is the seat of disease; and that the order in which these series are disposed should be the same as that in which the several organs are arranged in the physiological department of the Museum.

" Thus, to the series illustrating the physiology of the stomach, the heart, the brain, there would correspond as many series, placed in the same order, illustrating the pathology of each of these organs. Further, it is proposed that in each of these series the arrangement of the specimens should be like that adopted in the first division, in which the general principles of pathology are illustrated: so that while in the first division there will be found specimens showing the effects of inflammation, and the characters of morbid growths in general,—in these several series of the second division, there will be specimens of the same diseases in each particular organ or tissue of the body.

" Lastly, in a few cases in which the number of specimens of one disease is very large, a further subdivision is proposed. Thus, among the specimens of necrosis, amounting to upwards of 100, it is proposed that certain specimens should be placed first, to illustrate the general facts of that disease, its ordinary course and results, and the most remarkable deviations from them; and that after these the remaining specimens should be arranged according to the part affected. It is believed that by this plan, (which may also be applied to the specimens of some other important affections), the advantage will be obtained of demonstrating both the most interesting general facts observed in these diseases, and those which concern their particular local effects. It is anticipated that the whole of the plan proposed is such as will admit of any number of specimens being hereafter added to the Museum without disturbing the arrangement of those now in it."

In arranging the collection and preparing the Catalogue, every specimen was repeatedly examined by Mr. Stanley and Mr. Paget. The descriptions of what the preparations still display to the naked eye were written by Mr. Paget, and, after revision and comparison with the specimens, were sanctioned by Mr. Stanley. These gentlemen are, therefore, jointly responsible for the correctness of the descriptions.

In the case of the Hunterian specimens, Mr. Paget has inserted in every possible instance the histories or other detailed notices concerning them; employing and verifying for this purpose the numerous references which had been already made by Mr. Clift to the manuscripts and published writings of Mr. Hunter. He has also given all the details respecting the other preparations that could be collected from oral and manuscript communications, from contemporary publications, and from other sources.

It is to be regretted that little assistance towards giving full, as well as accurate, descriptions of the specimens could be derived from records preserved or received with them. In the Hunterian Manuscript Catalogues the greater part of the specimens were named rather than described. In the few instances in which they were described fully, or in such a manner as proved the special purpose for which Mr. Hunter placed them in his collection, the descriptions are inserted unaltered in the present catalogue.

In the pathological portion of the Museum of Sir Astley Cooper, scarcely a preparation had more attached to it than the name of the disease it was considered to display; neither did his numerous note-books and other manuscripts, or his correspondence, (the whole of which was obligingly placed at the disposal of the College by Mr. Bransby Cooper), afford more satisfactory information.

The notices of nearly all the specimens purchased from the Museums of Mr. Brookes and Mr. Heaviside, and of many from those of Mr. Taunton and Mr. Howship,* were equally barren. The same must be said of the large number of donations presented to the Museum by Sir William Blizard and Sir Everard Home. The specimens purchased from the Museums of Mr. Langstaff, Mr. Liston, and Mr. Walker, form a valuable but comparatively small list of exceptions to the general rule of deficiency in both the histories and the descriptions of the preparations.

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* The Council have to acknowledge the courtesy of the Medical Officers of the Charing Cross Hospital in giving Mr. Paget access to Mr. Howship's Manuscript Case Books, from which several brief histories of his specimens were obtained.

The Council has adopted every means in its power to remedy these defects: and it is just to state that whatever success has attended the endeavour to connect the histories with the descriptions of the Hunterian specimens, is mainly owing to the indefatigable labours of Mr. Clift, whose devotion to the service of Mr. Hunter has been in no instance more admirably displayed than in his efforts to put this portion of the Collection in the condition which Mr. Hunter himself would have desired. By the most persevering industry, Mr. Clift not only succeeded in connecting numerous specimens with their appropriate cases in the Hunterian Manuscripts (and this without any guide except his own intimate knowledge of both the collection and the manuscripts), but he also read and made copious extracts from nearly all the periodical and other medical works published in or near Mr. Hunter's time, in which there was the least probability of discovering a record of any specimen contained in the collection.

The Hunterian Manuscripts, from which the histories now published are taken, are contained in two Solanders, and two folio volumes with the titles,—

" Cases and Dissections."
" Cases and Observations."
" Cases in Surgery."
" Account of the Dissections of Morbid Bodies."

They are collections of cases of the most various kinds, in the handwritings of Mr. Bell, Sir Everard Home, and others who at different times acted as Mr. Hunter's amanuenses. Mr. Clift states that some of the cases were probably written as Mr. Hunter dictated them, but that the greater part were copied from the notes which he was in the habit of making on scraps of paper as often as he had a few minutes' leisure. Although not in Mr. Hunter's handwriting, yet these manuscripts bear marks of his approval and authority; for the titles of many of them are written by him, and others he has interlined, corrected, and punctuated, showing that he had carefully revised them; he also arranged them, and was in the frequent habit of referring to them. They have therefore been used on the present occasion with all the respect that is due to the remaining unpublished works of Mr. Hunter, and are printed with no other alteration than was required for orthography, and with no addition except the insertion, in brackets, of words which seem to have been accidentally omitted or changed by the amanuensis.

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DIVISION I.

GENERAL PATHOLOGY.

SERIES I.—HYPERTROPHY.

AMONG the least of those deviations from the natural condition of a part which are regarded as objects of morbid anatomy, is that named Hypertrophy, or overnutrition. Employing the term in its strictest sense, the specimens included under it are, first, parts enlarged and increased in power by an increase of their natural texture, the substance added to them being similar to that of which they are usually formed; and, secondly, parts increased in power, not so much by increase of size as by the development of a new tissue in them which is capable of higher functions than that of which they are usually formed. The first class are examples of hypertrophy by growth; the second, of hypertrophy by development: the increased power in the first is gained chiefly by an additional quantity, in the second chiefly by an exalted quality, of tissue: and, although when a part (for instance a muscle) acquires power by growing in size, it may attain at the same time, by development, a more robust texture, so that, perhaps generally, the two modes of hypertrophy proceed together, yet, almost always, the result shows that one of these modes has been predominant.

The conditions of which simple hypertrophy is usually the consequence are, either a disease of some part, the effects of which may, for a time or permanently, be remedied by the increase of power in another part; or, an increased flow of blood through a part. In the latter case the process of hypertrophy may be considered morbid, although the tissue which is produced may appear normal; but, in the former and most frequent cases, it is only in its relation to the previous disease that hypertrophy is justly a subject of morbid anatomy, for the process itself is that of health in a more than ordinary degree. The process of hypertrophy by growth is similar to that by which limbs and other parts are enlarged and strengthened in consequence of active exercise; that by development corresponds with the formation of muscle in the uterus as it enlarges in gestation;

and the usual result, in both cases, is the production of healthy tissue, by the action of which the ill effects of previous disease are counteracted. Thus, for example, in contraction of the orifice of the aorta, the left ventricle, strengthened by hypertrophy, may be able still to maintain a nearly healthy circulation of the blood; or, when one kidney is lost, the other may, by hypertrophy, be enlarged enough to discharge a double quantity of urine; or, when a tumour has grown within the wall or cavity of the uterus, the uterine walls may grow, and muscular fibres may be developed in them till they are strong enough to expel the tumour.

In these and all similar cases the process of hypertrophy is essentially reparative. It presents an instance of the exercise of that power which exists in all parts of the body, even after they have acquired their proper texture and their full size by ordinary development and growth,—the power of attaining yet greater strength when they are required to perform habitually a greater amount of their function. In the ordinary conditions of life the process of nutrition in each part is rarely carried beyond that of assimilation, in which it exactly repairs, in respect of both quantity and quality, the waste of tissue which is incurred in the ordinary action of each part; but whenever a part has to accomplish more than its usual function, it is found to have power more than enough to repair the greater waste which it suffers by greater exercise; the nutritive energy in it is increased; instead of mere assimilation, growth and development ensue; and by these it attains that greater strength with which it has now to act.

The muscular tissue is that which most plainly manifests this *reserve-power* of nutrition, but probably there is none which does not possess some measure of it: the following specimens are selected to show the effects of its operation in tissues very different from each other—muscle, bone, gland, cuticle, contractile fibro-cellular tissue, and hair. Many other specimens of like nature are arranged in the series illustrating special pathology.

1. A urinary bladder and part of a penis. The bladder has been laid open from the front; the urethra from behind. There is a narrow stricture of the urethra just in front of its membranous portion, and all the canal behind it is contracted, wrinkled, and superficially ulcerated. In consequence of this obstruction to the passage of urine, the bladder is hypertrophied. Its cavity is very large, measuring six inches in length and three in width. Its walls are proportionally strong; about half an inch thick. The fasciculi of the muscular coat are large, compact, and cord-like: the fibro-cellular tissue connecting them is closer and tougher than in the

ordinary condition, yet not morbidly indurated. The mucous membrane is thick, and is in many places pushed out in small pits through the meshes of muscular fasciculi which project in thick round ridges on the inner surface of the bladder; but the surface of the mucous membrane is smooth and velvet-like, and its tissue, though more compact than is usual, is not indurated: it appears only to have acquired additional strength in correspondence with the other hypertrophied textures of the organ. *Hunterian.*[*]

> "The bladder in such cases [of obstruction to the passage of urine] having more to do than common, is almost in a constant state of irritation and action; by which, according to a property in all muscles, it becomes stronger and stronger in its muscular coats; and I suspect that this disposition to become stronger from repeated action, is greater in the involuntary muscles than the voluntary; and the reason why it should be so is, I think, very evident: for in the involuntary muscles the power should be in all cases capable of overcoming the resistance, as the power is always performing some natural and necessary action; for whenever a disease produces an uncommon resistance in the involuntary parts, if the power is not proportionally increased, the disease becomes very formidable; whereas in the voluntary muscles there is not that necessity, because the will can stop whenever the muscles cannot follow; and if the will is so diseased as not to stop, the power in voluntary muscles should not increase in proportion.
>
> "I have seen the muscular coats of the bladder near half an inch thick, and the fasciculi so strong as to form ridges on the inside of that cavity;[a] and I have also seen the fasciculi very thin, and even wanting in some parts of the bladder, so that a hernia of the internal coat had taken place between the fasciculi and formed pouches. These pouches arise from the thin parts not being able to support the actions of the strong; as happens in ruptures at the navel or rings of the abdomen."—*Hunter; On the Venereal Disease: Works*, vol. ii. p. 299.
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> ---
>
> [a] This appearance was long supposed to have arisen from a disease of this viscus; but upon examination I found that the muscular parts were sound and distinct, that they were only increased in bulk in proportion to the power they had to exert, and that it was not a consequence of inflammation, for in that case parts are blended into one indistinct mass.

2. A parietal bone with small adjacent portions of the frontal, temporal, and occipital bones, and of some Wormian bones between them. They all,

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[*] Part of the preparation is engraved in Sir E. Home's 'Practical Observations on the Treatment of the Diseases of the Prostate Gland;' Vol. I. pl. iv. London, 1811.

and especially the parietal, exhibit the effects of increased growth, in adaptation to the enlargement of the head by hydrocephalus. The parietal bone weighs about four ounces, and measures, diagonally, nine inches. It is thin, but its texture appears healthy.

From the Museum of Joshua Brookes, Esq.

3. The pelvis and part of the chest, with the urinary and some of the adjacent organs, of an Argus pheasant (*Phasianus Argus*, Linn.). The left ureter is dilated, and the left kidney is very small, granular, and shrivelled. In compensation, the right kidney is increased to an unusually large size; not by distension, but apparently by growth of its natural texture, so that through it as much urine may have been excreted as through both kidneys in the ordinary state. There is a corresponding difference of size in the renal arteries; the size of each is adapted to that of the organ in which it is distributed. *Hunterian.*

4. A toe, on which, directly over one of its articulations, a corn has been formed, by the increased thickness and density of a portion of the cuticle which has grown and become harder in consequence of increased occasional pressure. Beneath the corn a small sac or bursa has been formed directly over the subjacent articulation. *Hunterian.*

"The cuticle admits of being thickened from pressure in all parts of the body: hence we find that on the soles of the feet of those who walk much the cuticle becomes very thick; also on the hands of labouring men. We find this wherever there is pressure, as on the elbow, upper part of the little toe, ball of the great toe, &c. The immediate and first cause of this thickening would appear to be the stimulus of necessity given to the cutis by this pressure, the effect of which is an increase of the cuticle to defend the cutis underneath. Not only the cuticle thickens, but the parts underneath, and a sacculus is often formed at the root of the great toe, between the cutis and ligaments of the joint, arising from the same cause, to guard the ligaments below."—***Hunter**; Lectures on Surgery: Works*, vol. i. p. 560.

"When from without, pressure rather stimulates than irritates: it shall give signs of strength and produce an increase of thickening: but when from within, the same quantity of pressure will produce waste [See Nos. 120, 121]; for the first effect of the pressure from without is the disposition to thicken, which is rather an operation of strength; but if it exceeds the stimulus of thickening, then the pressure becomes an irritator, and the power appears to give way to it, and absorption of the parts pressed takes place, so that nature very readily takes on those steps which are to get rid of an extraneous body, but appears not only not ready to let extraneous bodies enter the body, but endeavours to exclude them by increasing the thickness of the parts."—*Hunter: On the Blood, &c.: Works*, vol. iii. p. 466.

5. Part of a gall bladder inverted. It was distended by calculi, of which some small portions are still fixed in its mucous membrane. In consequence of this distension and the obstruction to the passage of bile, slender bundles of muscular fibres have been developed beneath the mucous membrane. The greater part of them have a nearly circular direction; but many, sweeping in various oblique directions, or radiating from certain points, interlace with these circular fibres, and form layers of irregular but close network, like a miniature of that seen on the inner surface of a *columnar* urinary bladder. The mucous membrane is so thin that the muscular fibres appear as if covered only by a delicate shining epithelium, and are prominent in the cavity of the gall-bladder. The peritoneal coat is thick and soft as if it had been œdematous, and is seamed like a membrane which has partially recovered from over-distension. *Hunterian.*

6. "A sore which had continued inflamed a long time, where the increased action had made the hair grow." [*Hunterian M.S. Catalogue.*] There is an ulcer of the integuments, apparently of a leg. For about an inch round the ulcer the hairs are very numerous, dark, and nearly an inch long: on the rest of the integuments they are much less closely placed, paler, shorter, and more slender.* *Hunterian.*

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* Nos. 52 and 54 are similar examples of hypertrophy of the spurs of cocks transplanted into the vascular tissue of their combs. In each of the series illustrating the special pathology of the several tissues and organs of the body, the specimens are arranged in an order corresponding with that observed in this division relating to general pathology. A reference, therefore, either to the general index of the preparations, or to the appropriate part of the descriptions of each series will afford a sufficient guide to the specimens chiefly intended to illustrate those changes (such as hypertrophy, atrophy, &c.) in each organ which are here illustrated in general.

SERIES II.—ATROPHY.

THE process of atrophy is the very contrary of hypertrophy; and the varieties of form in which its results are seen, and many of the conditions of which they are the consequences, answer, in exact opposition, to those illustrated in the preceding series. Thus, among the specimens of atrophy, as among those of hypertrophy, there are two principal forms; in the first, parts are diminished in size and power by the mere decrease of their natural texture, the tissue which remains being such as is natural to them in their healthy state, or only in degree different therefrom; while in the second form of atrophy, parts are decreased in power, not so much (if at all) by decrease of size as by deterioration of their tissue, a certain new tissue being formed in them which is capable of only lower functions than that of which it occupies the place. And thus, as hypertrophy may be either by growth or by development, so, atrophy may be either by decrease or by deterioration of tissue; as in hypertrophy the increase of power may be gained either by an additional quantity or by an exalted quality of tissue, so, in atrophy, the loss of power may be due to a defect in either the quantity or the quality of the tissue. Moreover, although the two modes of atrophy may often proceed together, yet in nearly every case one of them is predominant, and gives the peculiar character to the result.

The commonest example of atrophy by diminution of tissue is seen in simple *emaciation*, wherein the parts, however diminished in size, are, as to their texture, only less robust and of less density than in the healthy state. In atrophy by deterioration of tissue, the affected parts may retain their size and shape, but they lose their proper texture, and in its place fibro-cellular tissue, or, much more commonly, fatty tissue, is formed; so that nearly all examples of this mode of atrophy might be included under the name of *fatty degeneration*.

The conditions of which atrophy is the consequence are many more than those in which hypertrophy originates. Some are the opposites of these; thus, as a part which is (within certain limits) over-exercised is over-nourished, so, if one be disused, it suffers atrophy, till it falls into the state in which it is just capable of the reduced power which it has to exert, but is not capable of more. Again, as an increased flow of blood through certain parts may induce hypertrophy, so when the flow is diminished, short of complete hindrance, atrophy is the usual consequence. But atrophy may ensue in many conditions besides these. It is a constant attendant of old age, and of the similar decay which may occur at earlier periods of life; it is a consequence of many kinds of imperfection of the blood, which again may be the results of defect or error in any of the great chain of processes ministering to the formation of blood, and the maintenance of it in purity; or, in certain cases, it may be the result of a disturbance of the direct influence which the nervous system appears, at least in the higher animals, to exercise upon nutrition; and in some instances it ensues where it seems impossible at present to assign it to any known cause. But, it is to be observed, that the condition of which the atrophy of a part is the consequence does not always determine the form in which that atrophy will be manifested; thus, in old age the nutrition of nearly all parts is defective, but the defect appears in some persons in the form of emaciation, with comparatively little change of texture, while in others there is fatty degeneration of the several tissues and organs, with little diminution of their bulk, or with even an increase of it by the accumulation of fat. And so in more local atrophy, as, for example, that which follows paralysis of a limb, there is in some cases a mere wasting of the parts, and in others they become little if at all smaller, but in place of their natural texture abundant fat is formed.

The specimens included in this series are selected to show atrophy uncomplicated by other coincident morbid changes. In the following series illustrating special pathology many others of like kind will be found, and, besides these, many more in which the atrophy of a part is accompanied by some other morbid change of structure by which its results are modified or nearly hidden. Such specimens may be found most numerously among those of diseases of bone.

7. The metatarsal bone of a great toe and the metacarpal bone of a thumb, in which atrophy has reduced the compact wall to a thin, flexible, and fragile, nearly film-like layer, which is in many places perforated by minute apertures, and about the articular ends is partly deficient, partly broken away. The cancellous tissue has wide spaces bounded by very slender bony threads and lamellæ. The whole texture is light and dry, without an appearance of oily substance.

   Presented by Charles Deene Steel, Esq. They were part of a large collection of various bones from Malta, all similarly diseased; many presented at their articular surfaces the marks of hardening and polishing after the removal of their cartilages.

8. The skull of an old edentulous person. Together with a general diminution in the thickness and weight, and probably also in the size, of all the bones

of the skull, there is a peculiar atrophy of the jaw-bones and of the parts immediately connected with them, the consequence of the loss of the teeth. The alveolar margins of both jaws are completely absorbed; so that the border of the upper jaw is nearly on a level with the surface of the hard palate, and that of the lower jaw is but just above the mental foramina. Scarcely a trace of a tooth-socket can be seen; the margins of the jaw-bones are rough and hard. The whole texture of both maxillary and palate bones is light, dry, and smooth-surfaced. The posterior half of the hard palate is (except in the median line and at the posterior border) so thinned that it is transparent and flexible, and crackles as it bends. In the lower jaw, the circumference of which is every way more extensive than that of the upper jaw, the condyles are very small and narrow, and their compact layer has been removed; the rami and angles, like all the rest of the bone, are light, thin, and slender; and they present scarcely a mark of the attachment of the masseter, pterygoid, or any other muscles. Among the other bones of the skull, the atrophy is especially shown in the temporal and frontal. In each of the former, the plate forming the glenoid cavity is thin; the eminentia articularis is flattened, and, as it were, expanded into a broad and flat slight elevation; the zygoma is slender, and the marks of insertion of the temporal muscle are slight. In the frontal bone the orbital plates are thin and in parts transparent. The sutures which are usually open are all yet unclosed.

The lower jaw is fitted with a cross-bar and springs, to show the movements to which it is usually limited when thus changed after the loss of the teeth.* *Hunterian.*

9. Parts of the gastrocnemius and of two of the deep posterior muscles of the leg of a young man, who, probably from congenital paralysis of the leg, was lame from his birth, and had long carried his leg in a sling. The muscular tissue cannot be discerned in the gastrocnemius: in its place there is fat with only obscure traces of a linear arrangement of its elements. In the other muscles the same change has taken place; but a few pale muscular

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* See Hunter; On the Teeth: Works, Vol. II. p. 31.

fibres remain. The tendons are small but appear of healthy texture.

Ulcers, very slow in healing and leaving imperfect cicatrices, often formed on the leg; and the limb having become useless and inconvenient, was amputated. Some of the ulcers are shown in No. 26.

Presented by Sir William Blizard.

10. A *mutton-chop* in which all the tissues have suffered the same fatty degeneration as is shown in the preceding specimen. The bone appears soft and full of fat; and the sections of the *longissimus dorsi* and *psoas* muscles present a structure scarcely different from that of the adjacent adipose tissue. In what is shown of the abdominal muscles the muscular tissue is altered in a less degree. *Presented by Sir Joseph Banks.*

Examples of a similar fatty degeneration of muscle occurring in the heart will be found in Nos. 1519, 1520-1-2.

SERIES III.—REPAIR AND REPRODUCTION OF INJURED AND LOST PARTS.

Sub-Series A.—*Organization of Blood, in the vessels or effused.*

THE preparations in this and the two following Series are described and arranged so as they may best illustrate the principal doctrines propounded by Mr. Hunter in his 'Treatise on the Blood, Inflammation, and Gun-shot Wounds;' and the numerous extracts which are inserted from that work and from the Hunterian Catalogue will show that the illustration of those doctrines was one of the purposes for which the greater part of these specimens were collected.

11. The end of a femoral artery, after amputation, containing a small, flat, pale coagulum, which Mr. Hunter believed that he had injected.

" As extravasation arises from a rupture of a vessel, it is of service in the reunion of that vessel: if there are more solids ruptured than a vessel, as in a fracture of a bone, it

becomes a bond of union to those parts; and this may be called union by the first intention: but the union is not that of the two parts to each other, but the union of the broken parts to the intermediate extravasated blood; so that it is the blood and parts uniting which constitutes the union by the first intention.

"This blood, so extravasated, either forms vessels in itself, or vessels shoot out from the original surface of contact into it, forming an elongation of themselves, as we have reason to suppose they do in granulations. I have reason, however, to believe that the coagulum has the power, under necessary circumstances, to form vessels in and of itself; for I have already observed that coagulation, although not organic, is still of a peculiar form, structure, or arrangement, so as to take on necessary action, which, I should suppose, is somewhat similar to muscular action. I think I have been able to inject what I suspected to be the beginning of a vascular formation in a coagulum, when it could not derive any vessels from the surrounding parts. By injecting the crural artery of a stump above the knee, where there was a small pyramidal coagulum, I have filled this coagulum with my injection as if it had been cellular; but there was no regular structure of vessels. When I compare this appearance with that of many violent inflammations on surfaces where the red blood is extravasated, forming, as it were, specks of extravasation like stars, and which, when injected, produce the same appearance with what I have described in the injection of the coagulum; when I compare these again with the progress of vascularity in the membranes of the chick; where one can perceive a zone of specks beyond the surface of regular vessels close to the chick, similar to the above extravasation, and which in a few hours become vascular, I conceive that these parts have a power of forming vessels within themselves, all of them acting upon the same principle. But where this coagulum can form an immediate union with the surrounding parts, it either receives vessels at this surface, or forms vessels first at this union, which communicate with those of the surrounding surface; and they either shoot deeper and deeper, or form vessels deeper and deeper, in the coagulum, till they all meet in its centre. If it is by the first mode, viz., the shooting of vessels from the surrounding surfaces into the coagulum, then it may be the ruptured vessels, in cases of accident, which shoot into the coagulum; and where a coagulum, or extravasation of coagulable lymph, is thrown in between two [sound] surfaces only contiguous, there it may be the exhaling vessels of those surfaces which now become the vessels of the part. In whatever way they meet in the centre, they instantly embrace, unite, or inosculate. Now this is all perfectly and easily conceived among living parts, but not otherwise."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 118.

A notice of this preparation will be found, in a concise view of Mr. Hunter's then new opinions concerning the life of the blood, in Dr. Duncan's 'Medical Commentaries,' vol. ii. p. 198. London, 1774; under the head of 'Medical News.'

12. A Testicle on the surface of which are two coagula of blood, which are stated by Mr. Hunter to have become partially vascular, and were injected from the blood-vessels of the testicle.

"A man came into St. George's Hospital with an hydrocele, for which he was tapped with a lancet. When the water was evacuated, the testicle was larger to the feel than common, and in a month the tunica vaginalis was as much distended as before the operation. The radical cure was now determined upon; the tunica vaginalis was slit open, but the testicle being enlarged it was thought proper to extract it. Upon the body of the testicle was found a coagulum of blood, resembling a leech in appearance; and in the angle between the testicle and epididymis was another smaller one: at some parts it adhered to the testicle and epididymis, and at others it was loose from both.

"The adhesion of the large coagulum was firm, although it admitted of a separation, which was made at one end; when separated, fibres were plainly seen running between it and the testicle. The adhesions of the small coagulum were in many places still firmer. This blood had been extravasated by the puncture made with the lancet in drawing off the water, and had fallen down upon the testicle, where it coagulated.

"Over the whole surface of the tunica vaginalis there were vessels filled with blood, and clots of extravasated blood in different parts. . . . . .

The vessels of the testicle were injected, and, when magnified, "the whole surface of the testicle now appeared to be a layer of coagulating lymph become vascular. The surface of adhesion of the larger coagulum was injected for about one twentieth part of an inch, and extremely full of distinct vessels. The smaller coagulum was in many places injected through and through, in others only for a little way along the surface of adhesion."—*Hunter's Works; Description of the Plates xviii.* and *xix.*

A part of one of these coagula with the vessels passing into it is represented, magnified about twelve times, in the 'Philosophical Transactions' for the year 1818, vol. cviii., in pl. xiv., as an illustration of some observations by Sir Everard Home, in his 'Additions to the Croonian Lecture,' p. 193. The same engraving is appended to his 'Lectures on Comparative Anatomy,' vol. iv. tab. vii.

13. "A longitudinal section of the Tendo Achillis of a dog broken, and now united by extravasated blood, which is formed into or changed for Tendon, similar to the parts which it unites."—*Hunterian MS. Catalogue.*

14. The other section of the same tendon. *Hunterian.*

Further observations by Mr. Hunter on the organization of blood are connected with the descriptions of Nos. 76, 308, and 309; and his observations on the changes which blood undergoes when coagulated in the body but not fully organized are placed with the descriptions of No. 332 and other preparations in the 7th Series. See also from No. 1580 to 1585, and other similar specimens among the Diseases of Arteries; and No. 2107 to 2116.

SERIES III.—Sub-Series B. *Process of Healing.*

a. *Formation and Structure of Granulations.*

"Nature having carried the operations for reparation so far as the formation of pus, she, in such cases, endeavours immediately to set about the next order of actions, which is the formation of new matter upon such suppurating surfaces as naturally admit of it, viz., where there has been a breach of solids; so that we find following and going hand in hand with suppuration, the formation of new solids, which constitute the common surfaces of a sore. This process is called granulating, or incarnation; and the substance formed is called granulation." . . . . .

"Granulations and this new-formed substance are an accretion of animal matter upon the wounded or exposed surface; they are formed by an exudation of the coagulating lymph from the vessels, into which new substance both the old vessels very probably extend, and also entirely new ones form, so that the granulations come to be very vascular, and indeed they are more so than almost any other animal substance. That this is the case is seen in sores every day. I have often been able to trace the growth and vascularity of this new substance. I have seen upon a sore a white substance, exactly similar in every visible respect to coagulating lymph. I have not attempted to wipe it off, and the next day of dressing I have found this very substance vascular, for by wiping or touching it with a probe it has bled freely. I have observed the same appearance on the surface of a bone that has been laid bare. I once scraped off some of the external surface of a bone of the foot, to see if the surface would granulate. I remarked the following day that the surface of the bone was covered with a whitish substance, having a tinge of blue. When I passed my probe into it I did not feel the bone bare, but only its resistance. I conceived this substance to be coagulating lymph thrown out from inflammation, and that it would be forced off when suppuration came on; but on the succeeding day I found it vascular, and appearing like healthy granulations."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 488–491.

15. A portion of a leg and of a large healthily granulating sore upon its anterior aspect. Part of the tibia is exposed, and is increased in vascularity; granulations have arisen from the surface of another part. *Hunterian.*

"*Of Granulations independent of Suppuration.*"

"The formation of granulations, I have observed, is not wholly confined to a breach made in the solids, either by external violence and exposure, or in consequence of a breach in the solids, which had been produced by suppuration and ulceration, and afterwards exposed; for parts are capable of forming granulations, or what I suppose to be the same thing, new animal matter, where a breach has been made internally, and where it ought to have healed by the first intention; but the parts being baulked in that operation, often do not reach so far as suppuration, so as to produce the most common cause of granulation. The first instance of the kind that gave me this idea was in a man who died in St. George's Hospital.

"January, 1777. A man about fifty years of age, fell and broke his thigh-bone nearly across, and about six inches above the lower end. He was taken into St. George's Hospital; the thigh was bound up, and put into splints, &c. The union between the two bones did not seem to take place in the usual time. He was taken ill with a complaint in his chest, which he had been subject to before, and died between three and four weeks after the accident.

"On examining the parts after death there were found little or no effects of inflammation in the soft parts surrounding the broken bones, except close to the bones where the adhesive inflammation had taken place only in a small degree.

"The bones were found to ride considerably, viz., near three inches.

"The cavity made in the soft parts, in consequence of the laceration made by the riding of the bones, had its parietes thickened and pretty solid, by means of the adhesive inflammation, although not so much as would have been the case if the parts had been better disposed for inflammation: and some parts had become bony. There hardly was found within this cavity any extravasated blood or coagulating lymph, except a few pretty loose fibres like strings, which were visibly the remains of the extravasated blood.

"From these appearances this cavity had evidently lost its first bond of union, viz., the extravasated blood, which took place from the ruptured vessels; and probably the second had never taken place, viz., the coagulating lymph, in consequence of the adhesive inflammation: however, there was an attempt towards an union, for the surrounding soft parts, we have observed, had taken on the adhesive and ossific inflammation, so that in time there might have been formed in the surrounding soft parts a bony case, which would have united the two bones; but the parts being deprived of the two common modes of union, they were led to a third.

"From the ends of the bones and some parts of their surface, as well as from the inner surface of the soft parts, there was formed new flesh, similar to granulations. The hollow ends of the bones were filled with this matter, which was rising beyond the common surface of the bone, and in some places adhesion had taken place between it and the surrounding parts, with which it had come in contact. The same appearance which this new flesh had in this case I have several times seen in joints, both on the ends of the bones and on the inside of the capsular ligament [See 887, 905, 907, &c.], but never before understood how it was formed; hence we find that granulations can and do arise in parts that are not exposed. This is what I have long suspected to be the case in the union of the fractured patella, and this fact confirms me more in that opinion [See 535, 536].

"Here then we are shown that the cause of granulation, or the forming of new flesh for union (independent of extravasation or the adhesive inflammation), is more extensive in its effects than we were formerly acquainted with; and that granulations, or new flesh, arise in all cases from the first and second bond of union being lost in the part (which, indeed, seldom happens, except from exposure); it therefore makes no difference whether the first and second bond of union escape through an opening made in the skin, as in a compound fracture, or it loses its living powers, as in the present case, and as I suppose to be the case in a fracture of the patella, which obliges the absorbents to take it up as an extraneous body."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 490–1.

16. The fractured femur described in the foregoing quotation. *Hunterian.*

17. "Granulations of a tendon after amputation."—*Hunterian MS. Catalogue.*

18. A similar preparation. *Hunterian.*

19. A section of a Tendo Achillis, and of a thick layer of granulations on its surface, dried after the minute injection of the blood-vessels. The course of the vessels in the deepest part of the granulations is vertical to the surface of the tendon and nearly straight and parallel; they have many communications with each other, and are exceedingly numerous and closely arranged at and near the free surface of the granulations.

20. Another section of the same parts.* *From the Museum of Sir A. Cooper.*

> "The vessels of granulations pass from the original parts, whatever these are, to the basis of the granulations; from thence towards their external surface, in pretty regular parallel lines, and would almost appear to terminate there."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 492.

21. Portion of the integuments of an arm exhibiting part of a large surface of healthy granulations. The blood-vessels are injected. *Hunterian.*

22. A similar preparation, except that the surface of the granulations is more nearly level with that of the surrounding skin. *Hunterian.*

23. Portion of the integuments of a leg, and of an ulcer which was healing

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* Other parts of the same tendon are preserved, Nos. 355-6-7.

by the process of granulation. The granulations have a healthy aspect; their vascularity is shown by the minute injection of their vessels, and is in strong contrast with the pale thin margin of the surrounding skin. *Hunterian.*

> "When a sore begins to heal we find that the surrounding old skin close to the granulations (which had been in a state of inflammation, having probably a red shining surface, as if excoriated, and rather ragged), now becomes smooth and rounded, with a whitish cast, as if covered with something white, and the nearer to the cicatrizing edge the more white it is. This is, I believe, a beginning cuticle, and this appearance is probably as early a symptom of healing, and as much to be depended upon as any; so that the disposition in the granulations for healing is manifested in the surrounding skin."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 500.

24. A similar preparation. *Hunterian.*

25. Portion of the calf of a leg and of a large granulating sore upon it. Part of the granulations are attached to the fascia over the gastrocnemius muscle: their blood-vessels are imperfectly injected. *Hunterian.*

26. Portion of the integuments of a young man's leg, with three superficial ulcers, of which two have surfaces of healthy granulations, and the third, the highest on the leg, is nearly cicatrized. Some of the muscles of the same leg are preserved in No. 9. *Presented by Sir William Blizard.*

> "I have also observed that difference in the situation of similar structures in the body makes a material difference both in the powers of resistance to injuries, and of reparation when injuries have taken place. This difference seems to arise in proportion to the distance of the parts from the heart, or source of the circulation. Thus we see muscles, skin, &c., becoming more readily diseased in the legs than anywhere else, and more slow in their progress towards a cure; but this is not wholly to be laid to the charge of situation or distance from the source of the circulation, some portion of it is to be attributed to position, the legs being depending parts, and those parts which are most distant happen also to be the most dependent.[a] We find an horizontal position assist in the repair of such parts, but even then they are not equal in their powers to parts situated

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[a] We find in most authors the whole laid to this, which I shall more fully discuss in the history of opinions.

about the chest; the difference therefore is principally to be attributed to situation, or distance from the heart. The same disease that showed the comparative powers between the muscle and tendon, shows also that they are equally affected by position; thus we see ulceration and mortification taking place in the lower extremity, as such, more readily, and with less powers of repair, than happens in parts near the chest.

"This is still more the case if the person be tall. This is seen by changing a limb from a horizontal position, in which it was easy, to a dependent one, wherein it feels pain: because the new position increases the length of the column of blood in the veins. I am inclined to believe that the retardation of the cure is more owing to a stagnation of the blood in the veins, from the length of the column, than from a deficiency in the motion of the blood in the arteries. As the readiness of a part to fall into disease, and its backwardness to admit of cure, arises from position, it is in some degree compensated by rest and a change of the position."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 272. The same facts are considered at p. 492 of the Treatise.

27. "Granulations under the skin in an abscess in the leg, which were opposed by others on the muscles, and which were to unite. Those under the skin only are saved and folded towards each other, to show the opposition of two granulating surfaces."—*Hunterian MS. Catalogue.*

"Granulations have the disposition to unite with one another when sound or healthy: the great intention of which is to produce the union of parts, somewhat similar to that by the first intention, or the adhesive inflammation, although possibly not by the same means. The granulations having a disposition to unite with each other upon coming into contact, without the appearance of any intermediate animal substance, perhaps is in the following manner. When two sound granulations approach together, the mouths of the secreting vessels of the one coming to oppose the mouths of similar vessels of the other, they are stimulated into action, which is mutual: so that a kind of sympathetic attraction takes place, and, as they are solids, the attraction of cohesion is established between them: this has been termed inosculation."—*Hunter: On the Blood, &c.: Works*, vol. iii. p. 493.

b. *Formation and Structure of Cicatrices.*

28. The integuments of the stump of an arm healed after amputation. The smooth and shining depressed surface of the cicatrix, and the wrinkled, drawn-in borders of the surrounding skin are shown. The contraction which took place during the healing of the wound is also illustrated, for the cicatrix is little more than half an inch in diameter. *Hunterian.*

"Immediately upon the formation of the granulations, cicatrization would appear to be in view. The parts which had receded, in consequence of a breach being made in them, by their natural elasticity and probably by muscular contraction, now begin to be brought together by this new substance; and it being endowed with such properties, they soon begin to contract, which is a sign that cicatrization is to follow. The contraction takes place in every point, but principally from edge to edge, which brings the circumference of the sore towards the centre; so that the sore becomes smaller and smaller, although there is little or no new skin formed. . . . .

"Besides the contractile powers of the granulations, there is also a similar power in the surrounding edge of the cicatrizing skin, which assists the contraction of the granulations, and is generally more considerable than that of the granulations themselves, drawing the mouth of the wound together like a purse; this is frequently so great as to occasion the skin to grasp the granulations which rise above the surface, and is very visible in sugar-loaf stumps, where the projection of the sore is to be considered as above the level of the skin. This contractile power of the skin is confined principally to the very edge where it is cicatrizing, and I believe is in those very granulations which have already cicatrized; for the natural or original skin surrounding this edge does not contract, or at least not nearly so much, as appears by its being thrown into folds and plaits, while the new skin is smooth and shining. . . . .

"The uses arising from the contraction of the granulations are various. It facilitates the healing of a sore, as there are two operations going on at the same time, viz., contraction and skinning. It avoids the formation of much new skin—an effect very evident in all sores which are healed, especially in sound parts. In amputation of a thick thigh (which is naturally seven, eight, or more inches in diameter before the operation), the surface of the sore is of the same diameter, for the receding of the skin here does not increase its surface, as it does in a cut on a plane; yet in this case the cicatrix shall be no broader than a crown piece. This can be effected by the contractile power of the granulations [alone], for it is bringing the skin within its natural bounds. The advantage arising from this is very evident, for it is with the skin as it is with all other parts of the body, viz., that those parts which were originally formed are much fitter for the purposes of life than those that are newly formed, and not nearly so liable to ulceration."—*Hunter; On the Blood, &c.: Works,* vol. iii. p. 496–498.

29. The integuments of a well shaped stump of a thigh, smoothly and completely cicatrized. The effects of the contraction of the granulations and cicatrix spoken of in the preceding quotation are remarkably shown; for the cicatrix is narrow and only two inches long, and there is a deep radiated wrinkling of the skin around it. *Hunterian.*

30. The stump of a leg. It is nearly cicatrized; but it is conical ("a sugar-loaf stump"), and the bones project beyond the margin of the skin.

about the chest; the difference therefore is principally to be attributed to situation, or distance from the heart. The same disease that showed the comparative powers between the muscle and tendon, shows also that they are equally affected by position; thus we see ulceration and mortification taking place in the lower extremity, as such, more readily, and with less powers of repair, than happens in parts near the chest.

"This is still more the case if the person be tall. This is seen by changing a limb from a horizontal position, in which it was easy, to a dependent one, wherein it feels pain; because the new position increases the length of the column of blood in the veins. I am inclined to believe that the retardation of the cure is more owing to a stagnation of the blood in the veins, from the length of the column, than from a deficiency in the motion of the blood in the arteries. As the readiness of a part to fall into disease, and its backwardness to admit of cure, arises from position, it is in some degree compensated by rest and a change of the position."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 272. The same facts are considered at p. 492 of the Treatise.

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b. *Formation and Structure of Cicatrices.*

28. The integuments of the stump of an arm healed after amputation. The smooth and shining depressed surface of the cicatrix, and the wrinkled, drawn-in borders of the surrounding skin are shown. The contraction which took place during the healing of the wound is also illustrated, for the cicatrix is little more than half an inch in diameter. *Hunterian.*

The surface of the cicatrix is large; it is very vascular; and the cuticle covering it is extremely thin. *Hunterian.*

31. A linear cicatrix in the skin of a fish. The cicatrix is somewhat depressed, and the adjacent skin is drawn into deep wrinkles, which radiate in lines from its extremities and margins. *Hunterian.*

32. A portion of skin with the cicatrix of a circular ulcer, probably from an issue. The surface of the cicatrix is pale and shining; its centre and circumference are slightly elevated, and there are delicate radiating lines and wrinkles passing from the one to the other. *Hunterian.*

33. The upper lip of a man on which the operation for hare-lip had been performed. The cicatrix is complete and close, with a slight linear depression on each surface of the lip and an angle at its margin; but no hair has grown on the cicatrix. *Hunterian.*

34. " A cicatrized wound, injected, dried, and put into oil of turpentine, which shows how much more vascular the new parts are when compared with the old."—*Hunterian MS. Catalogue.*

35. The integuments of the end of a stump dried after the minute injection of their blood-vessels. The line of the cicatrix, which had probably been longer formed than that in the preceding specimen, contrasts strongly, by its slighter vascularity, with the surrounding tissue. Near the extremities of the cicatrix are three apertures where, probably, the process of healing was not completed.

From the Museum of Sir A. P. Cooper.

36 A section either of some granulations, or of a cicatrix on the skin, dried after the minute injection of their blood-vessels. *Hunterian.*

37. A portion of integument in which there is an ulcer nearly cicatrized. The

epidermis is reflected, and its continuity with the imperfect cuticle on the surface of the ulcer is shown. *Hunterian.*

38. A portion of integument, on which are the cicatrices of two nearly circular ulcers. *Hunterian.*

39. A portion of integument with a similar circular cicatrix. Part of the cuticle is reflected, showing the smoothness of the surface of the cicatrix and of the new cuticle. The new skin presents no appearance of wrinkles or of the natural network of depressed lines; it contains no hair-follicles; and the hair-follicles at the margins of the cicatrix, the cuticular linings of which have been drawn out with the epidermis, are less numerous than in other parts of the skin. *Hunterian.*

> " The new-formed cutis is at first very thin and extremely tender, but afterwards becomes firmer and thicker; it is a smooth continued skin, not formed with those insensible indentations which are observed in the natural or original skin, and by which the original admits of any distention the cellular membrane will allow of, as is experienced in many dropsies, white swellings in the joints, &c. This is proved by steeping a piece of dead skin, with a cicatrix in it, in water, to make the cuticle separate from the cutis; there we find that the new-formed cuticle becomes but little larger by such a process, which plainly shows that the new-formed cutis upon which this cuticle was formed, has a pretty smooth continued surface, and not that soft unequal surface which distinguishes the original cutis."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 503.

40. Part of the anterior wall of a man's chest, through which the gig-shaft which is placed near the preparation was driven long before death. The shaft entered on the left side between three and four inches from the sternum, just beyond the margin of the pectoralis major, and between the second and third ribs; it fractured the second rib in two places, and the cartilages of the third and fourth ribs; it was driven across the mediastinum, and passed out of the thorax about three inches from the right side of the sternum, between the second and third right ribs, fracturing the third rib. In its passage, it also appears to have separated the two upper portions of the sternum and to have driven their adjacent margins forwards. The tug-

iron of the shaft penetrated the chest and the lung rather lower down on the left side between the third and fourth ribs. The patient lived more than ten years after receiving the injury; and the preparation shows, on its anterior aspect, the thin tough layers of cicatrix-tissue by which the apertures in the walls of the chest were closed, the firm union of the fractured and displaced portions of the second left rib, the repair of the other ribs and of their cartilages, and the tough ligamentous union of the two separated portions of the sternum. On its posterior aspect, the preparation exhibits portions of the lungs adhering to the inner surface of the new tissue by which the apertures in the walls of the chest are closed, and a posterior view of the union between the portions of the sternum and the second left rib.

The patient, a robust gentleman, was endeavouring to replace a bridle on an unruly horse which was standing harnessed to a chaise near a stable-door, when the horse made a violent plunge and thrust him by the end of the off-shaft against a boarded part of the chaise-house. The patient felt the end of the shaft perforate his side under the left arm (which was raised high up), and then, as the horse continued plunging, he felt it pass from under his right arm, occasioning acute pain. The first of the two tug-irons, which was fixed twenty-one inches from the end of the shaft, and was three inches and a half in length, next came into contact with the chest, and, as the horse still pressed forward, was driven into it, while the end of the shaft projected several inches from the right side of the chest, and was forced five inches and a half through the thick boarding of the chaise-house. The patient's cries very shortly brought assistance, and the horse having been put back, he, with the aid of those who had come to him, drew himself off the shaft on which he was impaled. As soon as he was released he respired two or three times with some force, and found no alteration in his breathing; he then walked to a house a few yards from the stable, went up stairs to the second floor, and was nearly undressed when, for the first time, he felt faint, and almost immediately after had extreme difficulty of breathing with oppression of the chest, and a feeling as of "blood trickling on his lungs." His surgeon, Mr. Maiden, of Stratford, in Essex, found him thus suffering ten minutes after the accident, at about nine o'clock P.M.; he was sitting in bed supported by pillows, and air and blood were issuing freely from the wound made by the tug-iron. The wounds under the arms measured about four inches each, and the left shoulder and side of the chest were, in a slight degree, emphysematous. Four pounds of blood were quickly drawn from the arm, and the patient fainted. He passed the night quietly, and had some sleep; on the next day, also, nothing important happened; but on the day after, the difficulty of breathing and pain and weight in the chest were increased, and thirty ounces more of blood were drawn with much relief;

purgatives also were administered. On the next day, the third after the accident, he had the same symptoms, together with considerable pain about the region of the diaphragm, vomiting, and hiccup; he was again bled to eighteen ounces, and was again relieved. The same symptoms returned, and the same treatment was repeated, on the next day, and on the day following; and on both occasions the same relief was afforded by the loss of blood. On the sixth day no bleeding was deemed necessary, a large blister having been applied over the sternum; but on the seventh, the respiration becoming more difficult, nineteen ounces of blood were drawn. On the ninth also more blood was taken, and on this day it was first thought prudent to move the patient sufficiently for completely undressing him and examining the wounds. From this time he gradually recovered, and the wounds were nearly healed at the end of nine weeks. The patient lived ten years and nearly nine months after the accident. For the first five years he would never allow that he sustained any inconvenience, except from being put out of breath sooner than he used to be upon making any exertion, and from the motion of his arms being rather restricted. During this period, however, he had several fits of the gout, and a severe attack of acute rheumatism, after which he was subject to frequent attacks of difficulty of breathing, with palpitation of the heart, irregularity of the pulse, and other signs of disease of the heart. In an aggravated attack of this kind he died: but both this last attack, and the others of the same kind which he had suffered, might be referred as much to the adhesion of the pericardium and other changes in the heart from rheumatism, as to any change produced in the respiratory organs by the injury.

At the examination after death, besides the appearances seen in the preparation and the disease of the heart already mentioned, no morbid change was found, except in the lungs, which are described as " of a deeply livid hue and dense texture; only a small portion of the lower part of the left lung retained the natural appearance." Neither the account of the case before and after death nor the preparation is, however, sufficient to determine whether the gig-shaft, in its passage across the front of the chest, passed into either or both of the pleural cavities: the tug-iron must have wounded the lung (for air and blood escaped from the wound it made), but the shaft itself may have passed in front of, at least, the right pleura.

A further history of the case, with drawings of the preparations, are given in " An Account of a Case of Recovery after the Shaft of a Chaise had been forced through the Thorax; by William Maiden, Member of the Royal College of Surgeons in London." London, 1824, 4to.

Presented by William Maiden, Esq.

41. A valve of the shell of a fresh-water mussel (*Anodon cygneus*), in which a fracture has been repaired by a deposit of nacre on its inner surface. *Hunterian.*

42 A young branch of a fir-tree, on which there is a cicatrix with an irregular

thickening of the adjacent parts, in consequence of an injury,—probably a partial fracture, for it is bent to a right angle. *Hunterian.*

The best specimens for the further study of the process of repair, whether as it is naturally effected or as disturbed by various causes, are among the Tendons [Nos. 348 to 360], Bones [405 to 479, and many others], Arteries [1573 to 1581], Nerves [2163 to 2175], and Stumps after Amputations [2813 to 2833].

SERIES III.—Sub-Series C.—*Reproduction of Parts similar to those Lost.*[*]

43. The head of a fowl which, when very young, lost its upper mandible. In its place there has grown a horny process nearly an inch long, curved upwards and backwards, so as to form more than a semicircle, and therefore little capable of being adapted to act by opposition to the lower mandible.

The chicken was fed by hand for some time after the loss of its mandible, but was at length enabled by the aid of this substitute to feed itself on the ordinary food, and became fat.

Presented by William Marsden, Esq.

SERIES III.—Sub-Series D.—*Union of different Parts of the same or of different Bodies; Transplantation or Grafting of Parts.*

" I have hitherto explained union as taking place only in the division of corresponding parts of the same living body, but it is equally possible to unite different parts of the same or of different bodies, by bringing them into contact under certain circumstances. There is seldom occasion for such practice; but accident, or rather want of attention, has in some cases been the cause of union taking place between different parts of the body. The chin has been united to the breast, the tongue to the lips or cheek, &c.;

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[*] Several other preparations illustrating the complete reproduction of lost parts are preserved in the Physiological division of the Museum (Nos. 2190 to 2223). They were placed by Mr. Hunter among the preparations of parts peculiar to certain animals; but a place is here also assigned to similar preparations on account of the intimate relation which exists between the reproduction of a lost part and the more ordinary repair, or healing, of the surface from which a part has been removed; for, the repair and the reproduction may be considered as results of the same process carried on to different degrees; the least perfect kind of repair being that in which an ordinary cicatrix is formed, the most perfect that in which the part is completely reproduced. And the intermediate degrees are so numerous and so little different from each other that though, for convenience, a separation is made among the specimens which illustrate them, none can be said to exist naturally.

and when this happens it has commonly been through the medium of granulations. The attempt to unite parts of two different bodies has only been recommended by Taliacotius. The most extraordinary of all the circumstances respecting union is by removing a part of one body, and afterwards uniting it to some part of another, where on one side there can be no assistance given to the union, as the divided or separated part is hardly able to do more than to preserve its own living principle, and accept of the union.

"The possibility of this species of union shows how strong the uniting power must be. By it the spurs of the young cock can be made to grow on his comb, or on that of another cock; and its testicles, after having been removed, may be made to unite to the inside of any cavity of an animal. Teeth after having been drawn and inserted into the sockets of another person, unite to the new socket, which is called transplanting. Ingrafting and the inoculating of trees succeed upon the same principle."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 255.

44. "Here is the testicle of a cock, separated from that animal and put through a wound, made for that purpose, into the belly of a hen; which mode of turning hens into cocks is much such an improvement for its utility as that of Dean Swift when he proposed to obtain a breed of sheep without wool. The hen was afterwards killed, and the testicle was found adhering to the intestines, as may be seen in this preparation, where the parts are preserved."—*Hunter's Lectures: Works*, vol. i. p. 391.

See also Hunter; On the Blood, &c.: Works, vol. iii. p. 273; quoted in p. 26.

45. A similar preparation, in which, moreover, blood-vessels are injected passing from those of the intestine to the surface of the testicle. *Hunterian.*

46. A similar preparation. The testicle is chiefly adherent to the peritoneum lining the abdominal muscles. There is, also, a small but firm adhesion between the testicle and the intestines, and the blood-vessels are injected in both the adhesions. *Hunterian.*

47. A section of the head of a cock, and of a human tooth, which was transplanted, immediately after extraction, into a wound in the cock's comb. The surface of the fang is intimately united to the surrounding substance of the comb, and, by the injection of the blood-vessels of the head, vessels are demonstrated passing from those of the comb into the pulp of the tooth. *Hunterian.*

48. The other section of the same head and tooth. *Hunterian.*

49. A section of the comb of a cock into which a human tooth was similarly transplanted. The surface of the fang of the tooth is in contact, but not evidently united, with the comb. A pale fleshy growth extends from the comb into the pulp-cavity, but it has not, as in the last preparation, the appearance of a tooth-pulp, neither is its vascularity evident. *Hunterian.*

50. The other section of the same comb and tooth. There is here a narrow empty space between the surface of the tooth and the adjacent substance of the comb. *Hunterian.*

"I took a sound tooth from a person's head; then made a pretty deep wound with a lancet into the thick part of a cock's comb, and pressed the fang of the tooth into this wound, and fastened it with threads passed through other parts of the comb. The cock was killed some months after, and I injected the head with a very minute injection; the comb was then taken off and put into a weak acid, and the tooth being softened by this means, I slit the comb and tooth into two halves, in the long direction of the tooth. I found the vessels of the tooth well injected, and also observed that the external surface of the tooth adhered everywhere to the comb by vessels, similar to the union of a tooth with the gum and sockets."—*Hunter; On the Teeth: Works*, vol. ii. p. 104.

In a note to the above passage Mr. Hunter says:—

"I may here just remark, that this experiment is not generally attended with success. I succeeded but once out of a great number of trials."

In this account Mr. Hunter plainly alludes to the preparations marked 49 and 50, in which the comb has been separated from the head; but though he says he was only once successful in this experiment, it is certain that his success was much less in this case to which he alludes than in that of which the result is preserved in Nos. 47 and 48; for in them the union of the tooth and comb is perfect.*

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* Numerous preparations of transplanted teeth are preserved in the Series of Diseases of the Teeth [No. 1023 to 1026]; and other remarks by Mr. Hunter on the same subject are connected with the descriptions of them.

51. The head of a cock, dried. Two small spurs were transplanted into its comb, and have become firmly fixed in it. *Hunterian.*

52. The head of a cock, dried. A spur transplanted into the comb of the cock has grown into a kind of horn, which is about three-fourths of an

inch thick at its base, about six inches long, curved forwards and to the left side, and deeply bifid at its extremity. The ends of the portions into which the spur is divided appear to have been cut short to enable the bird to bring its beak to the ground in feeding, and perhaps also to prevent their pressing upon the side of its neck.[*] *Hunterian.*

53. The legs of the same cock. One of the spurs is nearly an inch, the other two inches in length; on both the legs, also, the horny scales are very large and thick, and the joints are enlarged, apparently by growths of bone. *Hunterian.*

54. The head of a Maltese cock, with a spur which was transplanted into the comb and has grown till it forms a double spire and measures about six inches in length. It presents the usual texture and appearance of spurs. The legs also are preserved, and both of them are spurred; on one, the spur is about an inch in length; on the other, from which, probably, the transplanted spur was removed, it is about three-quarters of an inch long. *Presented by Robert Keate, Esq.*

55. The leg of a chicken into which the spur of another chicken was transplanted. A section of the spur is shown: its union with the adjacent parts is not perfect. *Hunterian.*

56. The leg of a hen-chicken into which the spur of a young cock was transplanted. The spur is closely united to the adjacent parts, but has remained of small size. *Hunterian.*

57. A section of the leg of a young cock into which the spur of a hen-chicken was transplanted. The spur is closely united to the leg, and grew as fast and to as large a size as the spur which was left on the cock's other leg. *Hunterian.*

58. The metatarsal bones of two cocks into whose legs the spurs of hens were

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[*] The subject of this and of the following experiments was the common fowl (*Phasianus Gallus*).

transplanted. In all of them the osseous base for the spur is large, and has an irregular growth of bone attached to it. *Hunterian.*

"I have so far considered, in the general way, the comparative powers of different structures, of different situations, and of different positions in some parts of the body when affected by disease. Disease is the only circumstance which exposes these principles to our view; but to see how far the same principle was carried in natural operations, of which the most remarkable is the growth of parts, I made several experiments on fowls. The first was the common experiment of transplanting the spur of a young chicken from its leg to its comb, in which experiment I always found that the spur on the comb, when it took root, grew much faster and became much larger than that left on the leg. This I attributed to the greater power of action in the comb than in the leg, although they are pretty nearly at equal distances from the source of the circulation; but probably position also favoured it, as there was no stagnation in the veins of the head.

"In the power of producing such effects in disease, as well as in the growth of parts, I was then desirous to know the comparative degrees between the male and the female. I wished also to ascertain if the parts peculiar to the male could grow on the female, and if the parts of a female, on the contrary, would grow on a male.

"Although I had formerly transplanted the testicles of a cock into the abdomen of a hen, and they had sometimes taken root there, but not frequently, and then had never come to perfection, yet the experiment could not, from this cause, answer fully the intended purpose; there is, I believe, a natural reason to believe it could not, and the experiment was therefore disregarded. I took the spur from the leg of a young cock, and placed it in the situation of the spur in the leg of a hen chicken; it took root, the chicken grew to a hen, but at first no spur grew, while the spur that was left on the other leg of the cock grew as usual. This experiment I have repeated several times in the same manner, with the same effects, which led me to conceive that the spur of a cock would not grow upon a hen, and that they were, therefore, to be considered as distinct animals, having very distinct powers. In order to ascertain this, I took the spurs of hen chickens and placed them on the legs of young cocks. I found that those which took root grew nearly as fast, and to as large a size, as the natural spur on the other leg, which appeared to be a contradiction to my other experiments. Upon another examination of my hens, however, I found that the spurs had grown considerably, although they had taken several years to do it; for I found that the same quantity of growth in the spur of a cock, while on the cock, during one year, was as much as that of the cock's spur on the hen in the course of three or four years, or as three or four to one; whereas the growth of the hen's spur on the cock was to that of the proper spur of the hen* as two to one.

"These experiments show that there is an inequality of powers in different parts of the same animal, and that the legs have much less than the comb; they also show that there is a material difference in the powers of the male and the female. The spurs of a cock were found to possess powers beyond those of a hen, while, at the same time, the one animal as a whole has more power than the other; yet when I apply these principles to the powers of cure in local diseases of the two sexes in the human race, I can hardly say that I have observed any difference. It is to be observed, however, that women commonly live a much more temperate life than men, which certainly must have considerable influence both with regard to resisting and curing diseases."—*Hunter; On the Blood, &c.: Works*, vol. iii., p. 273.

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* In the original, *cock* is here by mistake put for *hen*: in Mr. Palmer's edition of the works of Hunter it is suggested that "one to two" should be read for "two to one:" but the reading here adopted agrees better with the context.

SERIES III.—Sub-Series E.—*Effects of the continued Presence of Foreign Bodies in the Tissues.*

"That the living principles in two bodies which have a perfect affinity to one another should not only be a preservative, but a cause of union, is evident; but even in bodies which appear foreign to one another the stimulus of an extraneous body is not produced where union is not intended, and cannot take place, although we should at first suppose that the extraneous stimulus would be given, and suppuration succeed.

"This is verified by the eggs of many insects which are laid under the skin of different animals, producing only the adhesive inflammation in the surrounding parts, by which the skin is thickened and a nidus is formed for the eggs.

"The Guinea-worm, called vena medinensis [*Filaria Medinensis*, Rudolphi], is also a striking instance of this; for while the animal is endowed with the living principle it gives but little trouble, yet if killed it gives the stimulus of an extraneous body, which produces suppuration through its whole length.

"Other instances of the same sort are—the œstrum bovis [*Œstrus Bovis*, Fabricius], which lays its eggs in the backs of cattle; the œstrum tarendi [*Œstrus Tarandi*, Fabricius], which lays its eggs in the back of the reindeer; the œstrum nasale [*ibid.*], which lays its eggs in the noses of reindeer; the œstrum hæmorrhoidale [*Œstrus equi*, or *Gasterophilus equi*, Leach], which lays its eggs in the rectum of horses; the œstrum ovis [*Œstrus ovis*, Fabricius], which lays its eggs in the nose and frontal sinuses of ruminating animals, particularly sheep; the little insect in Mexico called migna [*Acarus Americanus*, Linnæus], which lays its eggs under the skin; and, lastly, the cheggars [*Pulex penetrans*, Linnæus], which get into the feet of animals."—*Hunter; On the Blood: Works*, vol. iii. p. 256, in a note to the passage quoted, p. 23.

"This circumstance of the deeper-seated parts not so readily taking on the suppurative inflammation as those which are superficial, is shown in cases where extraneous bodies irritate any parts; for we find that extraneous bodies are in general capable of producing inflammation, but if these extraneous bodies are deeply seated, they may remain for years without doing more than producing the adhesive inflammation, by which means they are inclosed in a cyst, and only give some uneasiness; or if they are such as can be made to change their situation by the actions of the body upon them, as pins and needles, or from gravity, as is the case sometimes with bullets, then the parts through which they pass seem not to be much altered or disturbed;* but if the same body was nearer to the skin it would produce suppuration. This is proved by the cases that have occurred of people swallowing pins, needles, &c.: they have been found to travel almost over the whole body, without producing any effect, except in some situations exciting some sensation; but when they have come near to the skin, the very same substance has generally produced suppuration. This principle shows itself very remarkably in the cattle which feed in bleaching-fields: there is not one of these killed without having their stomachs, &c., stuck full of pins, and no seeming inconvenience takes place, for they appear to be healthy, and fatten as readily as other cattle. However, it is to be remarked that these pins are not found in the fourth or digesting stomach, therefore do not give that disturbance to the constitution that might be expected. It is probable that these cases of pins, &c., owe their want of power in producing suppuration, not entirely to situation but in some degree to the nature of the substance, metals perhaps not having the power of irritation beyond the adhesive, for when the adhesive has taken place the part appears to be satisfied. This appears also to be the case with the introduction of glass, even in superficial parts: a piece of glass shall enter the skin just deep enough to bury itself; inflammation shall come on; the wound in the skin, if brought together, shall heal by the first intention; and the inflammation shall not exceed the adhesive, but rather degenerate into the disposition for forming a sac, by which means a sac is formed round the glass, and no disturbance is given to the irritability of the parts."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 287.

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* This circumstance of such bodies moving in various directions, and not towards the surface, is a proof of the truth of my principle, for their motion arises from a mechanical cause, and is ruled by it; whichever way it is directed they must move, whether by gravitation, as is the case with bullets, or by the mechanical pressure of the part upon the two ends of the pin, which will determine the motion towards the point.

59. "In this preparation you see a maggot" [*Œstrus Tarandi*] "deposited, just below the skin, on the back of a reindeer: here the first stage of inflammation took place only; coagulable lymph was poured out, which has formed a chamber in which the insect resided."—*Hunter's Lectures: Works*, vol. i. p. 391.

Three nidi are shown, each with a small round opening through the surface of the skin.

60. Another portion of the skin of a reindeer, showing a similar nidus laid open to expose the Œstrus within it. *Hunterian.*

61. "A similar power is observable in vegetables. Here is an oak-leaf which I picked up in my garden; you observe on it seven or eight protuberances,

exactly circular and uniform. These have been formed by the insertion of the eggs of an insect" [*Cynips Quercus folii*] "into the leaf; and I cannot but think the process would have been different if any substance not possessed of the vital principle had been inserted."—*Hunter's Lectures: Works,* vol. i. p. 391.

62. "A needle passing from the second stomach (reticulum) of an antelope through the diaphragm and pericardium."—*Hunterian MS. Catalogue.*

63. "A portion of the second stomach of an ox, with pins sticking through its substance, without having produced inflammation." *Hunterian MS. Catalogue.*

Two large pins are shown which have penetrated through the bases of the partitions of the cells. All the tissues around them appear quite healthy.

64. A dried portion of the second cavity of the stomach of an ox, with a long nail which has passed through the bases of the partitions of several cells, but has produced none of the usual effects of inflammation. *Hunterian.*

65. "A portion of the" [second cavity of the] "stomach of a camel, to show that its being wounded by an iron wire has produced no inflammation."—*Hunterian MS. Catalogue.*

66. A portion of the stomach of a cod-fish (*Gadus Morrhua*), through the coats of which a large sharp fish-bone has protruded. None of the bone is now within the stomach, and of that which projects from its external surface, part is covered by tissue like false membrane, which was formed, probably, from lymph effused in consequence of the irritation attending the passage of the bone. *Hunterian.*

67. Part of a woman's breast removed on account of what was supposed to be a chronic tumour. A needle two inches long is imbedded in the mammary gland, the surrounding substance of which is indurated: the needle is covered with rust, but is in other respects perfect.

From the Museum of Sir A. P. Cooper.

68. A hundred needles of various sizes, and most of them entire, which were extracted from the body of a Danish Jewess.

Presented by Thomas Chevalier, Esq.

The history of this patient has been published by Dr. J. D. Herholdt, Professor of Medicine at Copenhagen.[*] Till her fifteenth year she had been healthy, and was a girl of acute mind. In August in this year (1807), shortly after puberty, she had an acute attack either of colic or peritonitis, which was aggravated by a blow; but she soon recovered. In November of the same year she had erysipelas of one side of the trunk, which disappeared after a few days, and then returned; and again disappearing, returned again several times in the three following months. Her strength was much reduced, and she became very *nervous*. She had palpitation of the heart, apparent threatenings of suffocation, vertigo, frequent sudden faintings, with tremors, and inability to move. In April, 1808, hysteric convulsions, with delirium and violent mania, were combined with the sudden faintings: the convulsions were of the most various kind, affecting every part of the body, and contracting all the limbs; and sometimes the body was for a long time completely fixed as if in catalepsy. In these attacks she was often jocosely delirious: sometimes she sang, and sometimes acted and recited passages from Goethe, Schiller, Shakspere, Ohlenslaeger, and others, with remarkable accuracy. Sometimes she was seized with heavy sleep, and lay without sense or motion, and apparently not drawing her breath, like one dead; and at these times her insensibility was so profound that she could not be roused by pricking or burning the skin. Thus she continued for a month, when, after violent convulsive efforts, she vomited blood; and this was followed by frequent fits of convulsive cough which lasted for half an hour at a time, and hiccuping. The vomiting of blood and a discharge of black matter from the intestines continued three or four days; and after this all her other symptoms—"syncope, sopor, delirium, insania, furor, spasmi, convulsiones, tussis et singultus"—went on unabated for seven months.

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[*] "Observatio de affectibus morbosis Virginis Havniensis cui plurimæ acus variis corporis partibus excisæ et extractæ sunt." Auctore J. D. Herholdt, Havniæ, 1822. 8vo.

A continuation of this history was published, in Danish and German, at Copenhagen in 1826, in 8vo., with the titles, 'Udtog af Prof. Herholdt's Dagböger over Rachel Hertz's Sygdomme i Aarene, 1807-26;' and 'Auszuge aus den über die Krankheiten der Rachel Hertz während der Jahre 1807-26 geführten Tagebuchern, mit Bemerkungen.' The account given above of the latter part of the case is from an abstract of the German edition of this work by Barkhausen, in the 'Medicinisch-Chirurgische Zeitung,' Innsbruck, 1827, band. iv. p. 375.

After January, 1809, she became subject to violent spasms of the abdomen and intestines, and retention of the urine; and these, without much variety, continued for nearly two years. Her attacks of insensibility used for several months to come on early in the morning and last till noon; and the only way in which she could be roused from them was by preventing her from breathing. Mesmerism was ineffectual to wake her; and all the medicines that could be imagined were employed now, as at all times before, in vain. In December, 1810, she remained insensible, with her body covered by sweat, with cold extremities, and death-like paleness, for seven days. No obstruction of the breath could rouse her for more than the time during which suffocation was imminent; and for six days she was believed to have complete suppression of urine. After these days she awoke spontaneously, had several rigors which were followed by feverishness, and in nine days all her former signs of illness ceased. For the next eight years her good health was interrupted only by attacks of measles, and other incidental illnesses; and it may be here remarked that, during all her former illness, there was nothing whatever in her conduct to lead to a suspicion that she either feigned or voluntarily exaggerated her disease.

On the 8th of January, 1819, she was seized with the most acute pain and tenderness of the abdomen, which continued unabated for several days, and was attended by discharge of blood from the stomach and intestines. On the 2nd of February a tumour like a deep-seated abscess was felt below the umbilicus; and ten days after this, the patient being extremely reduced, and apparently at the point of death, Professor Herholdt made an exploratory incision into the tumour. No pus, but a little blood, flowed; and he extracted a sewing-needle from the wound. The patient was relieved, but only for a time; for, three days after, a tumour appeared in the left lumbar region, and, on being opened, another needle was extracted from it. Between the 12th of February, 1819, and the 10th of August, 1820, two hundred and seventy-three needles, of different sizes, were extracted through incisions from various parts of the body, from one to seventeen being extracted at each time, and from one day to five months intervening between the operations. They were all blackened by oxydation, and many were broken. Whenever needles came to the surface, the patient used to have vomiting of blood and hiccup. She often complained of extreme pain in the part at which needles were afterwards extracted for some time before they appeared; and whenever this happened, the Professor used to search for the needles by separating considerable portions of the skin of the part from the subjacent muscles. About this time the patient's mother had an attack of apoplexy, and became paralytic; and shortly after, the patient herself had paralysis of both arms and aphonia. After the 10th of August no needles appeared for some time, and the patient gradually lost her paralytic symptoms, and completely recovered her health and strength; but her "whole abdomen was so marked with scars [of the wounds from which needles had been extracted] that it was like a map."

In May, 1821, a very large tumour appeared in the right axilla; and between this month and July, 1822, more than one hundred more needles were extracted from about the shoulder. The patient had also now retention of urine, like that in 1810. After this, *diabetes insipidus* came on; and soon after, a copious discharge of fluid like urine from the vagina. At length, however, after these discharges had continued a long time, both these and a frequent discharge of air by the urethra, as well as a paralysis of the right arm, and complete inability to leave her bed, were discovered to be feigned; for the patient being watched through a hole made in her door, was seen moving about in her room, writing with her paralytic arm, and injecting air with an enema pipe and bladder through her urethra. The history, however, does not give any information as to whether the patient had swallowed the needles, or had pushed them under the skin; neither does it state at what time she had done either of these.

69. Portion of a broken glass mirror, nearly two inches long and an inch wide, which, in a fall, was driven into a girl's breast.

The glass remained in the breast, unnoticed, for many weeks, the wound in the integuments having quickly healed over it. It at length attracted attention by producing pain; and in the suspicion that a tumour was forming, the girl consulted Sir William Blizard, by whom it was removed.

Presented by Sir William Blizard.

70. A cast, in lead, of an iron gun-breech and screw which, by the bursting of the gun, were driven into the head of an officer in India. They remained lodged in the ethmoidal cells and nasal fossæ, with part of the breech and rivet protruding through the fore part of the palate into the mouth, till the time of the patient's death, which happened seven or eight years after the accident. *Presented by Joseph Henry Green, Esq.*

The following account of the case is published by Sir George Ballingall, in 'The Edinburgh Medical and Surgical Journal,' vol. lvii., p. 119, Edinburgh, 1842, from a memorandum furnished by Deputy Inspector-general Marshall:—

In December, 1827, or January, 1828, Lieutenant Fritz, Ceylon Regiment, went out with his fowling-piece, and was found shortly after lying on the ground in a state of insensibility. The fowling-piece had burst, and he had received a wound in the forehead. He was conveyed to Badula, a distance of about nineteen miles, where he was attended by Assistant Staff-Surgeon Imley. The wound was situated on the brow or forehead, immediately between and a little above the axis of the eyes; it was known that the frontal bone was injured. After a few weeks the wound in the forehead had nearly healed, and the constitutional effects of the injury had completely disappeared. Towards the end of the year 1828, a metallic body protruded through the palate into the mouth, and during the rest of the patient's life advanced very gradually and became a little more loose. The sense of smell was lost, and there was a profuse and offensive discharge of purulent matter through the nose; but in May, 1835, Dr. Marshall wrote —"Jerry Fritz eats and drinks heartily and does his duty like his neighbours" . . . . "owing to the copious discharge from the nose, he claims the privilege of imbibing rather more freely than usual, for the alleged purpose of supporting his constitution." Within a year after this time Captain Fritz died; but the mode of his death is not mentioned.

Drawings are added to the paper to show the position in which the foreign body was fixed in the head. The large screw was in the frontal and anterior ethmoidal sinuses, and parts of the shaft and the rivet projected nearly an inch into the mouth.

SERIES IV.—PROCESS AND EFFECTS OF INFLAMMATION.

"I shall call by the name of inflammation whatever produces the following local effects, *viz.* pain, swelling, and redness, in a given time, and these dependent on, or the effects of, one immediate cause."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 297.

"I consider common inflammation to be an increased action of the smaller vessels of a part, joined with a peculiar mode of action, by which they are enabled to produce the following effects: to unite parts of the body to each other, to form pus, and to remove parts of the solids. These effects are not produced by a simple increase of action or enlargement of the vessels, but by a peculiar action, which is at present perhaps not understood.

"These three effects of inflammation I have called distinct species of inflammation. That which unites parts I have called the *adhesive inflammation;* that which forms pus, *the suppurative inflammation;* and that which removes parts, the *ulcerative inflammation.*

"In the adhesive inflammation the arteries throw out coagulable lymph, which becomes the bond of union. This however is not simply extravasated, but has undergone some change before it leaves the arteries, since in inflamed veins it is found lying coagulated upon the internal surface of the vessel, which could not have happened if simply extravasated. In the suppurative inflammation a still greater change is produced upon the blood before it is thrown out by the arteries, whereby it is formed into pus; which change is probably similar to secretion. In the ulcerative inflammation, the action of the arteries does not remove the parts; that office is performed by the absorbent vessels which are brought into action.

"In the two first species of inflammation there must be a change in the disposition and mode of action of the arteries; for the suppurative species cannot be considered as simply an increase of the action of the adhesive, as its effects are totally different; but in the third species there is probably no change of action in the arteries from that of the second, the action only of the absorbents being superadded, by which solid parts, and of course the arteries themselves, are removed."—*Hunter; On the Venereal Disease: Works*, vol. ii. p. 135.

71. "The two ears of a rabbit, the smallest in the natural state; the other was in a state of inflammation at the time of the death of the animal, and is more vascular, and in some degree thicker in its substance."—*Hunterian MS. Label.*

"Parts inflamed, when compared with similar parts not inflamed, show a considerable difference in the size of the vessels, and probably from this cause bring an increased number to view. I froze the ear of a rabbit and thawed it again; this excited a considerable inflammation, an increased heat, and a considerable thickening of the part.

"This rabbit was killed when the ear was in the height of inflammation, and the head being injected, the two ears were removed and dried. The uninflamed ear dried clear and transparent, the vessels were distinctly seen ramifying through the substance; but the inflamed ear dried thicker and more opaque, and its arteries were considerably larger."[a]

"The parts inflamed appear to become more vascular; but how far they are really so, I am not certain; for this appearance does (at least in part) arise from the dilatation of the vessels, which allows the red part of the blood to go into vessels where only serum and coagulating lymph could pass when they were in a natural state; and till the newly extravasated substances become vascular, the effect is most probably owing wholly to the above cause."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 322.

[a] A further account of this experiment, of which the prime design was to determine whether the life of parts of the body would be manifested again on thawing them after they had been frozen, is given in the same work at p. 108.

72. A portion of inflamed and very vascular peritoneum, injected and dried. *Hunterian.*

73. A portion of inflamed intestine and mesentery, dried after the minute injection of its blood-vessels, and exhibiting appearances of increased vascularity.* *Hunterian.*

SERIES IV.—Sub-Series A.—*The Adhesive Inflammation.*

a. *Effusion of Lymph and Blood in Inflamed Parts.*

74. "Coagulable lymph from the uterus of a woman (from Dr. Baillie)."—*Hunterian MS. Catalogue.*

75. "A ramifying portion of coagulating lymph coughed up from the lungs."

The history of the case is as follows:—

"A man, aged twenty-two, naturally healthy, had his constitution much weakened by a severe course of mercury, which brought on a very violent cough; he expectorated a quantity of mucus, often mixed with blood. His pulse became so irregular as not to be counted, and he generally felt a cutting pain in his chest.

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* Other similar specimens of peritonitis are preserved in the Series of Diseases of the Peritoneum (Nos. 1110 and 1111), and Mr. Hunter's account of the disease is appended to the descriptions of them.

"In a fortnight from this attack he began coughing up small pieces of coagulating lymph, like worms; these always produced a fit of coughing in their expulsion, and left an excessive soreness in some part of the chest; these portions were very numerous, increased in size, and had a branching appearance; the fits of coughing became also more violent. The specimen here represented was one of the largest; as they increased in size, the fits became less frequent, and at length disappeared, and the man got well. The patient was under the care of Mr. Saumarez, of Newington Butts, who gave the preparation to Mr. Hunter."—*Hunter's Works; Description of Plate* xxii.

No. 1845 is a similar portion of lymph from the same patient. Nos. 1846 and 1847 are other similar specimens; and the specimens of croup in the same series, from 1838 to 1842, present some of the best examples of effused lymph.

76. "Part of the tunica vaginalis" (of a man whose testicle is preserved in Nos. 2348, 2349). "The tunica vaginalis being filled with fluid, it was supposed to be an hydrocele, but proved to be a very bloody serum. The body of the testicle and tunica vaginalis were furred over with red coagulated blood which proved to be very vascular when injected." "Part of the coagulum is turned down; also a part of the extravasated lymph is hanging down loose, but not injected."—*Hunterian MS. Catalogue.*

77. Part of a dura mater, on the inner surface of which a thin compact layer of coagulated lymph is adherent. The lymph was effused after the dura mater had been wounded by a trephine. *Hunterian.*

78. "In this, which is part of the heart of an ox, here is a coat of coagulable lymph of extraordinary thickness; in one part nearly an inch thick."—*Parkinson's Hunterian Reminiscences*, p. 62.

On its free surface the lymph is drawn out in cylindrical columns an inch or more in length.

"It seems to appear, from observation, that some surfaces of the body do not so readily unite by the coagulating lymph as others, and therefore on such surfaces there is commonly a much larger quantity of this matter thrown out than probably would have been if union had readily taken place; for we may suppose, that where once union has taken place, extravasation is at an end. Thus we see in (what we may suppose) inflammation of the heart, that the coagulating lymph is thrown out on the exterior surface in vast quantities, while at the same time the heart shall not adhere to the pericardium. This is not only seen in the human subject but in other animals: in an ox, the heart was furred all over, and in some places the coagulating lymph was near an inch in thickness. The external surface of such hearts has an uncommon appearance; the outer surface of the coagulating lymph is extremely irregular, appearing very much like the external surface of a sponge, while the base or attachment to the heart is very solid and firm. However, in many instances we find the pericardium adhering to the heart, and generally in pretty close contact, which would make us suppose that the extent of motion of those two parts on one another is not great. These adhesions affect the pulse much, which is a good reason why nature avoids them as much as possible. On the other hand, it seems deducible from observation that neither the pia mater nor dura mater are apt to throw out much coagulating lymph, for here it would produce compression; and therefore we seldom find adhesions between them: in consequence of such accidents as produce suppuration between these two membranes, we seldom or ever find the surrounding parts adhering so as to confine the matter to the suppurating surface."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 347.

79. Portions of liver and diaphragm, with a thin soft layer of coagulated lymph between their adjacent surfaces. *Hunterian.*

80. Portion of a patella and its ligament, injected. The synovial surface of the ligament has a layer of lymph upon it, which extends for a short distance over the patella, and was believed to have been injected from the adjacent blood-vessels; but the injection appears to have escaped from the vessels. *Hunterian.*

81. Portion of small intestine injected and dried; the arteries being injected with red, the veins partially injected with yellow fluid. Four small portions of what was supposed to be coagulated lymph are attached to its peritoneal surface by slender pedicles, through which pedicles blood-vessels pass from those of the intestine. *Hunterian.*

82. Portion of small intestine, apparently from the same person as that last described, partially injected but not dried. It has several similar portions of the substance supposed to be coagulated lymph attached to its peritoneal surface. It is stated to have been strangulated in a hernia for twenty-four hours. *Hunterian.*

There can be little doubt that the two preparations last described were taken from the same person. The first is described in the Hunterian MS. Catalogue as 'Human intestine to show vascularity in the coagulable lymph thrown out upon its surface;' and the lower portion of it is represented in Hunter on the Blood, pl. vi. fig. 2 (plate xxi. fig. 2, in Palmer's Edition), and described as "The peritoneal coat of a portion of human intestine in an inflamed state, to show its vascularity, and to show a small portion of coagulating lymph attached to it by a narrow neck, which is supplied with vessels from it.' The second of these two preparations (No. 82) is described in the Hunterian MS. Catalogue as 'Intestine strangulated about twenty-four hours.' The first of the preparations is also that which was frequently described by Sir Everard Home, and was adduced by him (as it has been also by many others) for evidence that lymph can be effused, and become vascular, and have its vessels connected with those of the adjacent parts, in twenty-four hours. His account is as follows:—

"I performed the operation for the strangulated hernia, upon a man, in other respects in health, at seven o'clock in the morning. The hernial sac was laid open, and the gut, which proved to be a portion of the ileum, about six inches in length, was attentively examined previous to its being returned into the cavity of the belly: it had the natural polished surface, peculiar to an intestine; and although its vessels were turgid with blood, it did not appear that they were uncommonly numerous. After the operation, the symptoms did not abate so much as might have been expected; and, during the afternoon, he complained of pain in the lower part of his belly: he had no passage by stool; and next morning, about seven o'clock, his pulse was scarcely perceptible to the touch; his skin cold and clammy; and about twelve at noon he died, having lived twenty-nine hours after the operation.

"The body was opened, and the portion of gut, which had been strangulated, was found considerably inflamed; the external surface having lost its natural polish, and having several small portions of exuded coagulable lymph adhering to it. The vessels of the gut were minutely injected, the arteries with a red coloured injection, and the veins with a yellow one. Upon examination, afterwards, all these adhering portions of coagulable lymph were found to be injected, having a considerable artery going to each of them, and a returning vein which was larger than the artery. It is evident, therefore, that the coagulable lymph was laid upon the external surface of the gut after the operation; and we cannot suppose, that any such process as the forming of new vessels could have been going on during the last five hours of his life, when the pulse in the wrist was scarcely to be felt, and the powers of life were so much weakened in every respect. We must therefore conclude, that the whole operation of throwing out coagulable lymph, and supplying it with blood-vessels after it had become solid, was effected in less than twenty-four hours." [a]

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[a] 'A Dissertation on the Properties of Pus; by Everard Home, F.R.S.' London, 1788, 4to., p. 41. The same account is given in his 'Practical Observations on the Treatment of Ulcers on the Legs.' London, 1801, 8vo., p. 33. A notice of the case, with an engraving of a part of the preparation magnified about twelve times, is also given in the 'Philosophical Transactions for the year 1818,' vol. cviii. p. 192, pl. xiii. and in Sir E. Home's 'Lectures on Comparative Anatomy.' London, 1823, 4to., vol. iii. p. 16, and vol. iv. tab. vi.

It must be admitted that neither of these preparations affords sufficient evidence for the conclusion drawn by Sir Everard Home. The small shred-like portions of membrane attached by little pedicles to the intestine have not the appearance of recently coagulated lymph, but are fully organized, with traces of filaments and fat cells: they are also very regularly disposed at distances of from half an inch to an inch from each other; and are nearly all placed in two rows on each side of the intestine about an inch from the attachment of the mesentery, like very minute appendices epiploicæ, such as are met with, though very rarely, on the coats of the small intestine. It may therefore be fairly doubted whether these bodies had their origin in lymph effused at any time; and, if they had, they may have existed at the time of the operation, for they are too minute and delicate to have prevented the intestine from exhibiting the natural polished appearance of its surface. Mr. Hunter does not appear to have participated in Sir E. Home's view; had he believed these to be examples of lymph which had become vascular in twenty-four hours, it is not probable that he would have failed to record so important a fact, either in his catalogue, or in the description of the plate engraved from the very specimen which Sir E. Home describes and represents, or in his Work on the Blood; in which work (at p. 563), in relating a case which will be quoted after the description of No. 1179, he describes some 'recent, and of course very slight,' adhesions of the intestines formed twenty-four hours after a gun-shot wound, as having "taken place very early;" and in which (at p. 350) he speaks of nine days as a short time for the complete organization and adaptation of adhesions. (See the quotation in the note two pages hence.)

83. Part of "the uterus and vagina of an Ass on which experiments were made" by injecting a strong solution of corrosive sublimate (bichloride of mercury) "to produce inflammation upon its internal surface. The inflammation was followed by an exudation of coagulating lymph, an effect which is only produced on the inner surface of a canal opening externally by inflammation in its greatest degree of violence."—*Hunterian MS. Catalogue.*

"If this inflammation, which produced suppuration on those [mucous] surfaces, becomes more violent, or has something of the erysipelatous disposition, we find that it moves from the suppurative to the adhesive, and throws out the coagulating lymph. I have seen this in the intestines, often on the inside of intestines that had been strangulated in a hernia. I have been able also to produce it on the inside of the vagina of an ass, by injecting a strong solution of corrosive sublimate. But if of the erysipelatous kind, these surfaces will take on the adhesive action immediately or at first. This is evidently the case in what is called the ulcerous sore throat; I have seen it in the trachea; I have seen it thrown up from the lungs in branches; I have seen it in the pelves of the kidneys, ureters, bladder, and urethra."

"The natural heat of the vagina of a young ass was 100°. A solution of corrosive sublimate, as much as would dissolve in a tea-cupfull of water, viz. about ten grains, was injected into the vagina. In about two hours after the mercury fell to 99°. Thursday morning, 99°; evening, 100°. Friday morning, 99°; evening, near to 101°. Saturday morning, 99°; evening, 100°.

"This experiment was repeated several times upon the same ass, with the same result.

"In these experiments it can hardly be said that the heat was increased. That the inflammation had been raised to a very considerable degree was plain, for it produced a discharge of matter which was often bloody, and upon killing the ass for another experiment, the following appearances were found in the uterus.

"The horns of the uterus were filled with serum, and the inflammation had run so high by the stimulating injections which were used for the experiments on the vagina, that the coagulating lymph had been thrown out so as almost to obliterate the vagina, uterus, &c. by those adhesions which are the ultimate effects of inflammation on secreting canals, while suppuration is the ultimate effect of inflammation on internal surfaces: there were no signs of inflammation on the external surface of the uterus, which is covered by the peritoneum.

"It may just be remarked, that in most of those experiments the heat in the morning was a degree less than in the evening; and I may also remark, that this is commonly the case in the natural heat of the animal."—***Hunter; On the Blood, &c.: Works,*** vol. iii. pp. 289 and 341. The preparation is engraved in pl. xxiii.

84. "A portion of the ileum taken from the intestines of an ass. The intestine was in a state of inflammation, and shows the internal surface of the gut partly covered by a layer of coagulating lymph thrown out by the great degree of inflammation which the parts had undergone. The internal membrane was extremely vascular, and when injected, vessels were seen in portions of the coagulating lymph."—*Hunter's Works; Description of Plate* xxi., fig. 1.* Lymph is also thinly deposited upon the peritoneal coat of the intestine.

85. Another portion of the same intestine, imperfectly injected through its veins. *Hunterian.*

86. Another and similar portion. *Hunterian.*

87. Another portion injected through the arteries. On none of these three portions is lymph effused upon either the mucous or the peritoneal surface of the intestine. The last alone presents appearances of increased vascularity. *Hunterian.*

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* The lower part only of this preparation is represented in the plate referred to.

88. A portion of small intestine of which the coats are thickened. The mucous membrane is very dark, probably from unnatural vascularity, and has portions of coagulated lymph upon its surface. *Hunterian.*

89. A portion of small intestine which was strangulated in a hernia. Lymph has been deposited upon both the mucous and the peritoneal coats, and the mesentery is ulcerated near its attachment to the intestine. *Hunterian.*

b. *Completely Organized Effusions of Lymph, producing Adhesions, False Membranes, Thickening, Induration, Opacity, &c.*

"Every new substance that is formed is either for a salutary purpose, or it is diseased. The first consists either of adhesions or granulations, whether with the first or second intention; and these may be considered as a revival of the natural principles and powers of growth, whereas diseased substances are, as it were, monsters.

"In the adhesive inflammation, the vessels being enlarged, as above described, similar to what they are in the young subject, begin to separate from the mass some portion of the coagulating lymph, with some serum, and also red globules, and throw it out on the internal surface, probably through the exhaling vessels, or perhaps open new ones, and cover the sides of those cells, which easily unite with the opposite, with which they are in contact, forming the first progress of adhesions.

"That this is really the case, and that this effect has taken place in consequence of inflammation, is evident from the following observations:—In all large cavities, where we can make our observations with certainty, when in the state of inflammation, we find diffused over the sides, or through the cavity, a substance exactly similar to the coagulating lymph when separated from the serum and red blood after common bleeding. That the blood, when thrown out of the circulation from an inflammatory state of the vessels, as well as the blood itself, unites parts together, is probably best seen in the inflammation of the larger cavities above mentioned. The following I shall give as an example, which I have often observed on the peritoneum of those who have died in consequence of inflammation of this membrane. The intestines are more or less united to one another, and, according to the stage of the inflammation, this union is stronger or weaker; in some it is so strong as to admit of some force to pull them asunder;[*] the smooth peritoneal coat is, as it were, lost, having become cellular, like cellular membrane. When the vessels of this part are injected, we shall find that in those parts where a separation has been made by laceration, previous to the injecting, the injection will appear on that surface like small spots or drops, which shows that the vessels had at least passed to the very surface of the intestines.

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[*] Adhesions in consequence of inflammations become very soon strong, and are very soon elongated; probably as soon as they become organized they adapt themselves to their situation or the necessity. Thus the dog who had his belly opened to wound some lacteals, when killed on the ninth day, had his intestines connected by adhesion in several places, and those very firm and long.

"In parts where the union was preserved I have observed the three following facts:—On separating the united parts I have observed in some places the vessels come to the surface of the intestines, and then terminate all at once. In other places I could observe the vessels passing from the intestine into the extravasated substance, and there ramifying, so that the vessel was plainly continued from the old into the new. In a vast number of instances I have observed, that in the substance of the extravasation there were a great number of spots of red blood in it, so that it looked mottled. The same appearance was very observable on the surface of separation, between the old substance and the new, a good deal like petechial spots. How this red blood got here is the thing to be considered, especially as a good deal was within the substance of the coagulum. Was it extravasated along with the coagulating lymph? In this case, I should have rather supposed it would have been more diffused, and if not diffused, more attached to the intestine, and not in the centre of the coagulum; if it had been extravasation, one would have expected extravasation of injection, but we had none in any of these places; I have therefore suspected that parts have the power of making vessels and red blood independent of circulation. This appears to be evidently the case with the chick in the egg."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 349.

90. Section of a heart and of the adjacent reflected pericardium, with thick and tough adhesions by false membrane between them. *Hunterian.*

91. A thin section of a heart, with adhesions between the two layers of the pericardium, injected and dried. The principal vessels run in nearly straight lines from the surface of the heart to the reflected pericardium. *Hunterian.*

92. A thin section of a lung, with adhesions between the two layers of the pleura, injected and dried. *Hunterian.*

93. A portion of false membrane from the peritoneum, dried after the minute injection of its blood-vessels. The course and general arrangement of the vessels, with their loops at the furthest limit to which the injection has penetrated, are distinctly shown. *From the Museum of Sir A. P. Cooper.*

94. Another specimen of the same kind. *From the Museum of Sir A. P. Cooper.*

95. Portions of lung and diaphragm, with a layer of false membrane between their adjacent pleural surfaces, dried after the minute injection of their blood-vessels through one of the phrenic arteries. Many of the vessels of the false membrane are large and tortuous, and their branches compose a fine irregular network. Other new and tortuous vessels have been formed upon the surface of the pleura pulmonalis, and are continuous with those of the false membrane. *From the Museum of Sir A. P. Cooper.*

96. Portion of lung with adhesions, consisting of elongated, broad, and very thin layers of false membrane, between the two layers of pleura. The pleura pulmonalis is thickened and opaque at the part on which the false membrane is attached. *Hunterian.*

97. A similar specimen. The branches of the pulmonary artery have been minutely injected; but the injection appears to have passed into very few vessels in the adhesions. *Hunterian.*

98. "Adhesion between two parts of an intestine which is drawn out into a long string by the peristaltic motion of the intestine."—*Hunterian MS. Catalogue.*

> "We know that one effect of adhesive inflammation is the uniting of parts not intended by nature to be united, and which must thus be made less moveable on one another; in fact, they must at first have little or no motion on one another, as occurs in the cellular membrane and circumscribed cavities: but it happens that motion is again obtained after a time by the elongation of the connecting part, which is effected by the repeated endeavours for motion. These uniting media are seen to become vascular. They are perhaps often the cause of many indescribable sensations, which cannot be called pain."—*Hunter's Lectures: Works*, vol. i. p. 400.

99. Portions of liver and diaphragm, with long, slender, and very delicate bands and threads of false membrane extended between their adjacent surfaces. Both the peritoneal surfaces to which the adhesions are attached are thickened and opaque. *Presented by Sir William Blizard.*

100. "Union of tendon with tendon."—(*Hunterian MS. Catalogue.*) Portions of two tendons, the adjacent surfaces of which have become closely united by the adhesive inflammation.

101. A portion of the intestine and mesentery of a turtle, with a delicate layer of false membrane uniting two adjacent parts of the mesentery. *Hunterian.*

102. A section of a testicle on which the surfaces of the tunica vaginalis are completely united by a thick, compact, and tough layer of false membrane, with which their tissue has coalesced too intimately to be distinguished from it. *From the Museum of Sir A. P. Cooper.*

103. A rib, to the inner surface of which a large thin layer of substance like bone, with rough granular surfaces, is attached. It is probably the result of the imperfect ossification of false membrane, or of a layer of lymph-like granulations formed on the pleura in a case of empyema. *From the Museum of John Heaviside, Esq.*

104. A section of a spleen, the capsule of which is thickened and indurated by the organization of lymph deposited in and upon it. *Hunterian.*

105. "Half of the nerve of the leg of a man who had a very diseased tibia. A violent inflammation came on, of which he died."—*Hunterian MS. Catalogue.*

106. "The other half of the same. This nerve was extremely thickened and hard, as also extremely vascular, in consequence of inflammation and the injection having succeeded well. It was sliced down in the direction of its fibres, dried, and put into oil of turpentine."—*Hunterian MS. Catalogue;* in which also these two specimens were placed under the head of "Parts thickened in consequence of Inflammation, which may be called adhesions of the cellular membrane."

The following cases, though they belong to other specimens (Nos. 2178-9), yet will serve to illustrate the two preceding: they show that Mr. Hunter was aware of the general fact that the changes immediately produced by inflammation of a compound tissue, such as that of a nerve, a muscle, &c., do not affect the peculiar elementary structures of that tissue, but the fibro-cellular tissue by which they are connected; and that the inflammatory product is generally deposited not in, but between, the peculiar elementary structures of a tissue. As he says elsewhere, "When we cut into inflamed parts after death we find them firm and solid, resembling the section of a lemon, or some œdematous tumour, where we know extravasation has taken place. This appearance arises from the cells in the cellular membrane, and other interstices of parts, being loaded with extravasated coagulating lymph; from this circumstance they are cemented together, and become impervious to air, not similar in these respects to common cellular membrane or natural parts."—*On the Blood: Works*, vol. iii. p. 351.

" Inflammation of Nerves."

" A man at St. George's Hospital who had several violent inflammations and ulcerations in his leg, by which means many of the tendons sloughed, and at last lost the use of the joint of the knee and ankle, was obliged to have it cut off, which was done above the knee. I injected it for the different appearances of the parts. The posterior tibial nerve was very much enlarged, vascular, and very firm in texture where it passed through the inflamed parts, but above and below this it was natural. I slit the nerve down its middle through its whole length, and observed the nervous chords running through this thickened substance very distinct, and could easily separate them from one another, and each chord appeared to be as sound or natural when cut into as in the other parts of the nerve; so that the thickening and hardness of the nerve was owing to the uniting cellular membranes being loaded with coagulable lymph, which like other inflamed parts [had] become more vascular."

In another case of " Inflammation of Nerves," Mr. Hunter says:—

" Mr. Anderson's ischiatic nerve had been denuded for more than four inches where it became of a bluish black; but where it was in contact with the living parts which were become inflamed, there it was also become inflamed and thickened; but this thickening was owing to the cellular membrane being loaded with coagulable lymph. From these two cases it would appear that the nervous substance is not so susceptible of inflammation, or is not so easily altered in texture by inflammation, as their uniting membrane."—*Hunterian MS.* " *Cases in Surgery*," p. 686.

Among the effects of adhesive inflammation in the following series, the most remarkable examples of adhesions of surfaces are 1114, 1115, 1116, 1507, 1508, 1509, 1510, 1749, 1751, 1754, 1755, 2375, 2376, 2377; and those of thickening and induration of tissues 1117, 1118, 1120, 1252 to 1259, 2528 to 2537, 1491, 1492, 1493.

The organized products of inflammation, like the natural parts of the body, are liable to various diseases: they may inflame; lymph may be deposited in them, and be organized in the same manner as themselves were [1512, 1513, 1753]; they may suppurate and ulcerate [710, 1388, 1389, 1758, 1759]; or mortify [588 to 592], or various morbid substances may be formed in them, such as tubercle [299, 1128-9, 1803], and cancer [1791].

For examples of thickening and cysts formed around foreign bodies, of which Mr. Hunter speaks in a passage following that quoted above from his *Works*, vol. iii. p. 351; see Nos. 59, 60, 61, 67, 69.

SERIES IV.—Sub-Series B. *The Suppurative Inflammation.*

"I formerly divided the surfaces capable of taking on inflammation into two; the first of these was the cellular membrane in general, together with the whole circumscribed cavities; the second was all the outlets in the body, commonly called mucous membranes; for instance, all the ducts of glands, and the alimentary canal.

"The first order of parts, I have already observed, generally, if not always, takes the adhesive first, in the true inflammation, and then all the three inflammations in succession; for the adhesive is immediately admitted in the cellular membrane and circumscribed cavities, to exclude, if possible, suppuration, where suppuration, and of course ulceration, would be hurtful.

"In the following parts, the order of inflammation, with regard to its being adhesive or suppurative, appears to be inverted; as the ulcerative is a consequence either of the adhesive or of the suppurative inflammation, it is ruled equally by both. In internal canals,[a] where adhesion in most cases would prove hurtful, the parts run immediately into the suppurative inflammation, the adhesive inflammation in common being excluded; such parts are the internal surfaces of the eyelids, nose, mouth, trachea, air-cells of the lungs, œsophagus, stomach, intestines, pelvis of the kidneys, ureters, bladder, urethra, uterus, vagina, and indeed all the ducts and outlets of the organs of secretion, which all these parts mentioned may be in some degree reckoned, and which are commonly called mucous membranes. In such parts, if the inflammation is but slight, the suppurative in common takes place, which is almost immediate, as it is not retarded by the adhesive stage, which accounts for the quickness of suppuration of these parts in many cases. I have known a violent discharge of pus come on the surface of the urethra only a few hours after contamination. These facts are shown us every day in various inflammations of those parts, and particularly in the gonorrhœa, cold in the nose, lungs, intestines, &c. The matter from such is generally not called true matter, or purulent, but is often so, if not always, having all the characters of pus; however, this will be according to circumstances. Since those surfaces are, in general, secreting surfaces, suppuration would appear to be only a change in the secretion; and I think I have visibly seen, or could visibly trace, the one change gradually leading into the other: the different parts, therefore, of which the pus is composed will not always be in the same proportion, so that the matter will seem to vary from true matter towards that of the common secretion of the part, and *vice versâ*. But this does not alter the position, for it is common to matter from a sore; and even common to our ordinary secretions."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 288.

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[a] I make a distinction between an internal cavity and a canal; they are very different in their construction; their uses, and also their mode of action in disease are very different.

107. The anterior part of the penis of a man who had gonorrhœa at the time of his death. The urethra is laid open, and bristles are placed in the orifices of the lacunæ. Its mucous membrane (the blood having been removed from it) has a healthy aspect.

> "Till about the year 1753, it was generally supposed that the matter from the urethra in a gonorrhœa arose from an ulcer or ulcers in that passage; but from observation it was then proved that this was not the case.
>
> "It may not be improper to give here a short history of the discovery of matter being formed by inflammation without ulceration. In the winter, 1749, a child was brought into the room used for dissection in Covent-garden; on opening of whose thorax a large quantity of pus was found loose in the cavity, with the surface of the lungs and the pleura furred over with a more solid substance, similar to coagulable lymph. On removing this from those surfaces, they were found entire. This appearance being new to Dr. Hunter, he sent to Mr. Samuel Sharp, desiring his attendance; and to him it also appeared new. Mr. Sharp afterwards, in the year 1750, published his Critical Inquiry, in which he introduced this fact, "That matter may be formed without a breach of substance;" not mentioning whence he had derived this notion. It was ever after taught by Dr. Hunter in his lectures. We however find writers adopting it without quoting either Mr. Sharp or Dr. Hunter. So much being known, I was anxious to examine whether the matter in a gonorrhœa was formed in the same way. In the spring of 1753 there was an execution of eight men, two of whom I knew had at that time very severe gonorrhœas. Their bodies being procured for this particular purpose, we were very accurate in our examination, but found no ulceration. The two urethras appeared merely a little blood-shot, especially near the glans. This being another new fact ascertained, it could not escape Mr. Gataker, ever attentive to his emolument, who was then attending Dr. Hunter's lectures, and also practising dissection under me. He published soon after, in 1754, a treatise on this disease, and explained fully, that the matter in a gonorrhœa did not arise from an ulcer, without mentioning how he acquired this knowledge; and it has ever since been adopted in publications on this subject. Since the period mentioned above I have constantly paid particular attention to this circumstance, and have opened the urethra of many who at the time of their death had a gonorrhœa, yet have never found a sore in any; but always observed that the urethra, near the glans, was more blood-shot than usual, and that the lacunæ were often filled with matter."—*Hunter; On the Venereal Disease: Works*, vol. ii. p. 158.

108. A compound and comminuted fracture of a tibia, widely exposed in front. The preparation was marked by Mr. Hunter as an example of "Suppuration taking place in consequence of a breach in the solids not being allowed to heal by the first intention."—*Hunterian MS. Catalogue.*

> "Violence done to parts is one of the great causes of suppuration; but we have already remarked that violence simply does not always produce this inflammation, but

that it must be a violence followed by a prevention of the parts performing their cure in a more simple way, viz. a restoration of the structure, so as to carry on the animal functions of the part, or in other words, a prevention of union by the first or second intention; or attended with this circumstance, viz. that the parts are kept a sufficient time in that state into which they were put by the violence; or, what is something similar to this, a violence attended with death in a part, such as in many bruises, mortifications, sloughs in consequence of caustics, &c., which, when separated, have exposed internal surfaces."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 404.

109. The lumbar vertebræ of a person who died with lumbar abscess. The lower part of the body of the second lumbar vertebra and the intervertebral substance beneath it have been destroyed by ulceration. The remaining parts have approximated, producing a slight projection backwards into the vertebral canal. The anterior ligaments and periosteum of the vertebræ, both above and below the diseased part, are reflected. They are thickened and consolidated, and appear to have been widely separated from the spine by a collection of pus and thick curd-like substance, some of which remains adherent.

The preparation was marked by Mr. Hunter as an illustration of that "Suppuration without Inflammation" which he describes in the following passage:—

"*Collections of Matter without Inflammation.*

"I have hitherto been describing true suppuration, which I have said, 'I believe is a consequence only of inflammation,' a process generally allowed. Also in treating on the cause of suppuration, viz. inflammation, I hinted, that there were often swellings, or thickening of parts without the visible or common symptoms of inflammation, viz. without pain, change of colour, &c., and I also hinted, in treating of suppuration, that there were collections of matter, somewhat similar to suppuration, which did not arise in consequence of the common inflammation; these I shall now consider. I conceive all such collections of matter to be of a scrofulous nature; they are most common in the young subject, and seldom found in the full-grown or old: they are commonly called matter or pus, and therefore I choose to contrast true suppuration with it. Although I have termed this suppuration, yet it has none of its true character, any more than the swellings, which are the forerunners of it, have the true characters of inflammation; and as I did not call them inflammatory, strictly speaking I should not call this suppuration; but I have no other term expressive of it.

"Many indolent tumours, slow swellings in joints, swellings of the lymphatic glands, tubercles in the lungs, and swellings in many parts of the body, are diseased thickenings, without visible inflammation; and the contents of some kinds of encysted tumours; the matter of many scrofulous suppurations, as in the lymphatic glands; the suppuration of many joints, viz. those scrofulous suppurations in the joints of the foot and hand; in the knee, called white swellings; the joint of the thigh, commonly called hip-cases; the loins, called lumber abscesses; the discharge of the above-mentioned tubercles in the lungs, as well as in many other parts of the body, are all instances of matter being formed without any previous visible inflammation, and are therefore in this one respect all very similar to one another. They come on insensibly, the first symptom being commonly the swellings, in consequence of the thickening; which is not the case with inflammation, for there the sensation is the first symptom . . . .

"All those formations of matter not preceded by inflammation, nor a consequence of it, are, I believe, similar to each other, having in this respect one common principle, very different from inflammation. The cancer, although it produces a secretion, yet does not produce pus till exposed; it is, therefore, one of those diseases, like the scrofula, which does not suppurate till inflammation comes on, and even seldom then; for true suppuration arises from inflammation, terminating in a disposition to heal, which is not the case with cancer. In the scrofulous suppuration there is often a like reluctance to heal."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 419.

110. Part of the walls of an abscess of the leg, exhibiting its internal surface covered by a thin layer of soft but compact, yellowish-white and, probably, vascular lymph—such as has been described as a "pyogenic membrane."
From the Museum of Sir A. P. Cooper.

111. Part of the walls of a large abscess, and of the integuments which covered it and in which ulceration was going on. The walls of the abscess are lined by a thin layer of lymph, to which also numerous loosely hanging shreds of lymph are attached. *Hunterian.*

112. A mass of coagulated lymph from the cavity of an abscess. *Hunterian.*

113. A similar specimen. *Hunterian.*

114. "Coagulable lymph found in an abscess in the lungs."—[*Hunterian MS. Catalogue.*] It is a layer of large size, from one to four lines in thickness, pale, compact, and apparently not vascular. *Hunterian.*

"By the formation of this new substance, the coagulating lymph, which was extravasated in the adhesive state of the inflammation, and adhered to the sides of the cells, either in cut surfaces, as in wounds, in abscesses, or circumscribed cavities, is pushed off from these surfaces; and if it is the inner surface of a cavity, it is pushed into it, so that the cavity contains both coagulating lymph and pus."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 439.

115. The integuments covering an abscess which *pointed.* The skin is very thin at the most prominent part, and its surface is deprived of cuticle.
Hunterian.

116. A portion of integument exhibiting an aperture through which an abscess opened.

"In consequence of the pressure of pus in an abscess, Nature sets up three processes to let it out: first, progressive absorption; secondly, interstitial, by which the progressive is assisted; thirdly, the relaxing process, making the parts yield to distension."—*Hunter's Lectures: Works*, vol. i. p. 422.

Some of the following preparations will illustrate more fully Mr. Hunter's meaning in this passage, and his account of the connection of these processes with ulceration. The best other examples of abscess are 2064, 2066, and 2067,—specimens of abscess in the brain in which the wall or cyst of the abscess is formed only of lymph effused and organized in a uniform layer.

117. "The inner surface or bottom of an abscess in the joint of the knee which had no disposition to heal, and became fistulous."—*Hunterian MS. Catalogue.*

118. The closed end of a sinus connected with the abscess last described, exhibiting the narrowness of the passage and its vascular folded internal surface.
Hunterian.

119. Another portion of the same sinus.

"The term fistula gives a very inadequate notion of the disease, the fistulous canal being only the sign of the disease,—the means of conveying a fluid or extraneous matter to the surface. A fistula is the consequence of the powers of a part not being able to remove the original cause, so that the original cause and some of its effects remain.

"The causes of fistula are various, but may be divided into two classes: first, the obstruction of the passage of some natural secretion, as fistula of the parotid gland; or of the canal for the passage of extraneous matter, as the intestines being strangulated so as to mortify, or being wounded [Nos. 1383 to 1390]; but all obliterations of the ducts where the fluids make a new passage will not be termed fistulæ: secondly, the formation of pus or extraneous matter in a part requiring a passage, as in fistula in ano [Nos. 1259 to 1263], fistula in the joints [885, 974, &c.], and fistula from diseased bone [Nos. 646, 675, 677, 690, &c.]. . . . . .

"The second species of fistula, or that from disease, arises from the disproportion in the disposition to heal of different parts, viz. the internal and the external; the skin healing, while the deeper-seated parts, or seat of the disease, have no disposition for it.

It may arise from two causes: 1st, from any extraneous substance in the inner parts; 2ndly, from a diseased state of the original part, when the disease formed. The first happens in large deep-seated abscesses, which are prevented healing at the bottom by the pressure of the matter. The second has two causes; the first from the part being naturally indolent, as tendons; the second from a disease in parts naturally ready to heal, but the disease being deep-seated, the skin is more ready to heal than the bottom of the fistula, and thus obstructs the necessary free discharge."—***Hunter's Lectures**: **Works***, vol. i. p. 577, 579.

For illustration of the Healing of Abscesses, see No. 27, and the quotation annexed to its description. Various other examples of fistulæ, besides those above referred to, are in Nos. 165, 1250, 1251, 1997, 2041-2-3-4-5, 2552-5-6, 2560, &c.

SERIES IV.—Sub-Series C.—*The Ulcerative Inflammation.*

"As these [absorbent] vessels are productive of a vast variety of effects in the animal economy, which are very dissimilar in the intention and effect, they may be viewed in a variety of lights, and admit of a variety of divisions. I shall consider them in two views: first, as they absorb matter, which is not any part of the machine; secondly, as they absorb the machine itself.

"The first of these is the well-known use, the absorption of matter, which is no part of the machine." . . . . .

"In the second of these views we are to consider them as removing parts of the body itself, in which they may be viewed in two lights. The first is, where only a wasting is produced in the whole machine, or part, such as in the wasting of the whole body from an atrophy; or in a part, as in the wasting of the muscles of the leg, &c. from some injury done to some nerve, tendinous part, or joint, all of which I call interstitial absorption, because it is removing parts of the body out of the interstices of that part which remains, leaving the part still as a perfect whole.[a] [See Nos. 7, 8, 381, 382.] But this mode is often carried further than simply wasting of the part; it is often continued till not a vestige is left, such as the total decay of a testicle; so that the interstitial absorption might be understood in two senses.

"The second is, where they are removing whole parts of the body. This may be divided into the natural and the diseased.[b] In the natural they are to be considered as the modellers of the original construction of the body; and if we were to consider them fully in this view, we should find that no alteration can take place in the original formation of many of the parts, either in the natural growth, or that formation arising from disease, in which the absorbents are not in action, and take not a considerable part: this absorption I shall call modelling absorption." . . . . .

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[a] "This mode of absorption has always been allowed or supposed, whether performed by the lymphatic veins or lymphatics."

[b] "These uses I claim as my own discovery. I have taught them publicly ever since the year 1772."

"Absorption in consequence of disease is the power of removing complete parts of the body, and is in its operation somewhat similar to the first of this division, or modelling process, but very different in the intention, and therefore in its ultimate effects. This process of removing whole parts in consequence of disease in some cases produces effects which are not similar to one another: one of these is a sore or ulcer, and I therefore call it ulcerative. In other cases no ulcer is produced, although whole parts are removed, and for this I have not been able to find a name; but both may be denominated progressive absorption."—*Hunter; On the Blood, &c.: Works*, vol. iii. pp. 460-462.

"The second [kind or degree of interstitial absorption] is the absorption of a whole part, where not a vestige is left. This would seem to be of two kinds; one where it is only a consequence of another disease, and is a necessary and useful effect of that disease, as in assisting in bringing parts to the surface; but the other appears to arise from a disease in the part itself; as the total decay of the alveoli, without any disease in the teeth or gums, which however in the end suffer; as also the total wasting of a testicle, the absorption of a callus, &c. It is the first of these two kinds which is most to my present purpose, and deserves our particular attention. It takes place in a thousand instances; we find it gradually taking place in the part of the body which happens to lie between encysted tumours and the external surface, when they are making their way to the skin. This absorption is commonly slow in its progress, so much so as even to make the ultimate effect, although considerable, not sensible till a certain length of time has elapsed.

"This mode of removing parts appears to arise from pressure, as in the former; but here some principles are reversed. The contents of an encysted tumour do not give the stimulus of removal to that side of the cyst nearest to the external surface, as happens in an abscess, so as to produce a removal of the surface pressed by its contents, which would be the progressive ulceration, as in our first division; but the tumour gives the stimulus to the sound parts, between it and the skin, and an absorption of those parts takes place, similar to that which I suppose takes place in the removal of calluses of bones from weakness. We find, whenever an encysted tumour is formed in the cellular membrane, it in time makes its approaches towards the skin, by the cellular membrane and other parts between it and the skin being absorbed, so that the whole substance between the cyst and the skin becomes thinner and thinner, till the cyst and the external skin meet or come in contact, and then inflammation begins to take place; for as the parts are now soon to be exposed, inflammation takes place to produce a quicker absorption, which borders often upon ulceration."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 470.

120. A part of the integuments of an abdomen thinned by interstitial absorption,

in consequence of the pressure of an encysted tumour, which grew beneath them, and over the origin of the right *rectus abdominis* muscle.

The patient, a man who was in St. George's Hospital, died in consequence of the tumour being opened.

Hunterian.

121. "An encysted tumour in the cellular membrane very near the skin, and which had opened externally by the second of our first modes of ulceration" [that is, the second kind or degree of interstitial absorption, which, as expressed in the foregoing quotation, borders upon ulceration].—*Hunterian MS. Catalogue.*

"It is by the progressive absorption that matter or pus, and extraneous bodies of all kinds, whether in consequence of or producing inflammation and suppuration, are brought to the external surface [Nos. 115, 116]; it is by means of this that bones exfoliate; [Nos. 641 to 660, and other specimens of Necrosis]; it is this operation which separates sloughs; [Nos. 131 to 136, &c.;] it is the absorbents which are removing whole bones while the arteries are supplying new ones; and although in these last cases of bones it arises from disease, yet it is somewhat similar to the modelling process of this system in the natural formation of bone; it is this operation that removes useless parts, as the alveolar processes when the teeth drop out [as in No. 8], or when they are removed by art; as also the fangs of the shedding teeth, which allows them to drop off; and it is by these means ulcers are formed.

"It becomes a substitute in many cases for mortification, which is another mode of the loss of substance; and in such cases it seems to owe its taking place of mortification to a degree of strength or vigour superior to that where mortification takes place; for although it arises often from weakness, yet it is an action, while mortification is the loss of all action. In many cases it finishes what mortification had begun, by separating the mortified part.

"These two modes of absorption, the interstitial and the progressive, are often wisely united, or perform their purposes often in the same part which is to be removed; and this may be called the mixed, which I believe takes place in most cases, as in that of extraneous bodies of all kinds coming to the skin; also in abscesses, when in soft parts [No. 116]. It is the second kind of interstitial absorption, the progressive and the mixed, that becomes mostly the object of surgery, although the first of the interstitial sometimes takes place, so as to be worthy of attention."—*Hunter; On the Blood, &c.: Works,* vol. iii. p. 463.

"The progressive absorption is divisible into two kinds; one without suppuration, the other with. I shall now observe that the absorption which does not produce suppuration may take place either from pressure made by sound parts upon diseased parts, or by diseased upon sound parts; as the effect that the pressure of the coagulated blood has in aneurisms, the moving blood in the same. which is a sound part, contained in diseased arteries not capable of supporting the pressure of the moving blood; as also many tumours, which are diseased parts, pressing upon natural sound parts; and these diseased parts are simply endowed with life, which I apprehend makes some difference in the effects respecting the formation of pus; also uncommon pressure made by such substances as are not endowed with any irritating quality sufficient to produce the suppurative inflammation, as a piece of glass, a lead bullet, &c."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 471. See also the quotation at page 27 in reference to this statement about the influence of foreign bodies.

121A. Five dorsal vertebræ, of which parts of the sides of the bodies have been hollowed out by the "progressive absorption without suppuration," determined by the pressure of the blood in an aneurismal sac. The similarity of this process to the "modelling process" is shown by the fact that though the bodies of the vertebræ are deeply hollowed out, yet their cancellous tissue is not exposed; their size and shape have been changed, but they retain a complete thin external layer of compact tissue; they have, indeed, been only *remodelled* in adaptation to the aneurismal sac.

Presented by Sir William Blizard.[*]

"Besides these two modes of removing whole parts, acting singly or together [*i. e.* besides the interstitial and the progressive absorption], there is an operation totally distinct from either; and this is a relaxing and elongating process carried on between the abscess and the skin, and at those parts only where the matter appears to point. It is possible that this relaxing, elongating, or weakening process may arise in some degree from the absorption of the interior parts; but there is certainly something more, for the skin that covers an abscess is always looser than a part that gives way from mere mechanical distention, excepting the increase of the abscess is very rapid."

"That parts relapse or elongate without mechanical force, but from particular stimuli, is evident in the female parts of generation just before the birth of the fœtus: they become relaxed prior to any pressure. The old women in the country can tell when a hen is going to lay, from the parts becoming loose about the anus."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 477.

122. "This preparation represents the front of a chest, which contained an aneurism of the aorta; and here, on the right side, you see an instance of

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[*] The specimen of Aneurism by which Mr. Hunter illustrated this kind of absorption is No. 3465. See his Lectures in his 'Works,' vol i. p. 422, and pl. xvii. fig. 4. Nos. 955 and 976 afford good examples of similar absorption in consequence of pressure. The best other specimens of aneurisms producing absorption are 1652-5-6-7-8, 1674-5, 1682-3.

the elongating process, the cartilages being bent outwards, or elongated, to adapt themselves to its figure."—*Hunter's Lectures: Works*, vol. i. p. 422.

> "The process of ulceration, or [progressive] absorption with suppuration, is almost constantly attended by inflammation; but it cannot be called an original inflammation, but a consequent, which gave rise to the term ulcerative inflammation. It is always preceded by the adhesive inflammation, and perhaps it is simply this inflammation which attends it. We find the adhesions produced answering very wise purposes; for although the adhesive inflammation has preceded the suppurative, and of course all the parts surrounding the abscess are united, yet if this union of the parts has not extended to the skin, where the abscess or matter is to be discharged, in such a case, wherever the ulceration has proceeded beyond the adhesions, there the matter will come into unadhering parts; the consequence of which will be that the fluid or matter will diffuse itself into the cellular membrane of the part, and from thence over the whole body, as in the erysipelatous suppuration; but to prevent this effect, the adhesive inflammation takes the lead of ulceration. [See Nos. 110, 115, 116, &c.] There are many other causes of ulceration, which operate on surfaces, where we do not see the same necessity for it; when the matter formed can be and is discharged without it; such parts are many old sores; the inside of the stomach and intestines, and indeed all the surfaces above mentioned, which do not admit readily of the adhesive inflammation, under some circumstances admit of the ulcerative. This effect would appear to arise from the violence of the inflammation, the parts being so weakened, either by it or some former disease, that they can hardly support themselves; for we find in salivations, where the whole force of the mercury has been determined to the mouth, they have become weakened by long and violent action; the gums and inside of the mouth will ulcerate; also, from the same weakening disposition the gums will ulcerate in bad scurvies; therefore weakness joined with inflammation, or violence of action, appears to be the immediate cause in such cases.
>
> "The effect then of irritation, as above described, is to produce first the adhesive inflammation in such parts as will readily admit of it, and if that has not the intended effect, the suppurative takes place, and then the ulceration comes on to lead the matter already formed to the skin, if it is confined."—*Hunter; On the Blood, &c.: Works*, vol. iii. p. 474.

123. The lower end of an ileum with the cœcum, exhibiting numerous ulcers of the mucous membrane. The surfaces of the ulcers are smooth, and formed by the muscular coat of the intestine, the fibres of which are distinct, and appear healthy; their margins are well defined, and formed by thin, healthy, and in some instances overhanging, mucous membrane. All the intervening portions of mucous membrane appear quite healthy. It is evident that the disease had its chief seat in the submucous tissue, in

which, probably, pus collected, and was discharged through ulcers of the mucous membrane; so that the disease might be regarded as abscess followed by extensive ulceration of the superjacent tissue. *Hunterian.*

124. A portion of colon from the same person as the last specimen, with numerous similar ulcerations. *Hunterian.*

125. A portion of skin in which there is a small round granulating ulcer, with smooth edges. *From the Museum of Sir A. P. Cooper.*

126. A portion of the integuments of a leg with an ulcer. The surface of the ulcer is uneven; part of its surface is ragged and shreddy as if it had sloughed; in other parts it appears to have spread very deeply: there are scarcely any granulations. *Hunterian.*

127. A portion of ulcerated skin dried after the minute injection of its blood-vessels. *From the Museum of Sir A. P. Cooper.*

128. Blood-vessels of the skin surrounding an ulcer minutely injected with mercury. *From the Museum of Sir A. P. Cooper.*

129. A portion of the integuments of a leg, in which, with a varicose state of the veins, there is a round ulcer, having an uneven, coarsely granulated surface. Small masses of earthy matter, indicated by bristles, are fixed in cavities in the granulations. Besides this chief ulcer are two of smaller size, circular and deep, and another more superficial, of which a part only is shown. It is doubtful whether the earthy masses were phlebolithes, or deposits in the cellular tissue around diseased veins.

From the Museum of Sir A. P. Cooper.

For specimens of healing and healed ulcers, see Nos. 21 to 26, and 32, 37, 38, 39; and numerous specimens in the series of Special Pathology. The foregoing specimens illustrate only the process of simple ulceration, and that in a general way, and as it occurs in the natural parts of the body. The various forms of peculiar ulceration observed in and about new growths are shown in Nos. 175 to 251, 269 to 272, and other specimens in the series of Tumours, or thence referred to. References to many examples of specific ulceration are given in pages 60 and 61; and the best examples of the different forms of simple and specific ulcers in one and the same tissue will be found among the Diseases of Bone, from 604 to 640, and among those of the Intestines, from 1195 to 1232.

Series V.—MORTIFICATION: Death of parts of the body.

> "The effects of life are preservation and action; death is the loss of both. Life may exist in the whole, or only in a part; but it must always be in a vital part. Other parts may be dead, without materially affecting the machine. The immediate cause of death in a part would appear to be a loss of circulation; this may arise in various ways, but it must be the effect of some cause. Mortification is very different from universal death: the loss of natural life arises from some universal action having taken place, the same structure still remaining; but it is altered in mortified parts, all is blended in one mass of animal matter, and cannot possibly be injected.
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> "*Partial death, or mortification,* arises from various causes, yet there is probably in all of them some cause which may be called specific."—*Hunter's Lectures: Works,* vol. i. p. 602.

a. *From violent Mechanical Injury.*

130. Part of a fore-finger, with its metacarpal bone and the surrounding tissues, as an example of the death of a part from a mechanical injury. The metacarpus was severely bruised, and there is a black spot, from sloughing or effusion of blood, extending from the deeper part of the skin to the metacarpal bone. A small portion of the proximal end of the metacarpal bone appears also to have been in process of exfoliation. *Hunterian.*

> "In proportion to the deficiency of the living principle, the sooner will death be induced: as happens in bruises, in which the cellular membrane sloughs before the skin, though the skin is the part most injured."—*Hunter's Lectures: Works,* vol. i. p. 604.

b. *From Heat.*

131 to 136. A series of six preparations to illustrate the process of the separation of sloughs made by the actual cautery on the ears of rabbits. All the ears have been dried after the minute injection of their blood-vessels, and the number marked on each indicates the number of days, after the beginning of the experiment, which had elapsed when the ear was removed. On the second day, there is a zone of slightly increased vascularity sur-

rounding the dead part, but separated from it by a pale line. The adhesion between the dead and living parts is as yet perfect. On the fourth day, the vascularity of this zone is much increased, and reaches to the very border of the dead part. On the sixth, the zone appears less vascular (but the vessels are not well injected), and the connexion between the dead and living parts is wrinkled. On the eighth, the zone is very vascular, increasing in the closeness of its vessels towards the border of the dead part, from which it is exactly defined, though the separation has not yet commenced. On the tenth day, the slough is more than half separated. On the thirteenth, it remains attached by a very small portion; the adjacent living part is thickened and smoothly rounded, and there is the same vascular zone at and around its border as in the earlier stages of the process. *From the Museum of Sir A. P. Cooper.*

" The separation of a dead part from a living is performed by the absorbents, which take into the circulation the edges of the sound parts which adjoin to the dead, and thus the dead part being set at liberty drops off. But in order to effect this, inflammation is first produced, and then ulceration or absorption follows."—***Hunter's Lectures: Works***, vol. i. p. 606.

Nos. 641 to 653 are specimens of Necrosis produced by the application of heat to bones.

c. *From Cold.*

137. Two fingers which mortified from exposure to cold in an Arctic expedition, and were amputated. They are black, dry, and shrivelled, and part of the cuticle has peeled off them. *Presented by Alexander Fisher, Esq.*, 1820.

d. *From Escharotics, and Chemical Action.*

138. A portion of skin to which a caustic had been applied. The part destroyed by the caustic is discoloured and circumscribed by a narrow ulcerated groove, indicating the commencement of the process of its separation by the ulceration of the adjacent living parts. *Hunterian.*

139. A portion of scrotum to which caustic had been applied for the cure of a hydrocele. The part destroyed by the caustic has been detached from the subjacent surface. *Hunterian.*

Other examples of the death of parts produced by chemical action are Nos. 898, 1081, 2338, 2561-2-3-4; perhaps, also, the specimens of Necrosis of the Jaws from the use of mercury [such as Nos. 714 and 715], may be here referred to: and the following specimen is placed here because of the illustration which Mr. Hunter considered it to afford of the action of arsenic.

140. A breast, which together with a large carcinomatous tumour in it, separated by sloughing.

The following history of this case in Sir E. Home's 'Observations on Cancer,' London, 1805, 8vo., p. 91, Case XXII., was taken from the Hunterian MSS. The original title was "Case of Cancer of the Breast, where the whole tumour mortified and separated, in consequence of a fever attended and followed by great debility; which shows the theory of the action of arsenic when applied to parts whose powers are small: and also gives a good hint respecting mortification:"—

"A lady had for some time been afflicted with a cancer in her breast. The whole breast was involved in this disease. It was become considerably swelled and very firm in texture. Besides the swelling of the breast, there was a fungous tumour, about the size of a large egg, situated between the breast and axilla, in the course of the absorbents; and the glands of the axilla were tumefied. Both the breast and this tumour were ulcerated, discharging a large quantity of thin matter, and often bled, so as to be alarming. In one of these bleedings Mr. Hunter was sent for, and applied lint dipped in oil of turpentine, which stopped the bleeding for some time. It gave her great pain for the whole day, through the substance of the breast, as also in the axilla, and down the inside of the arm; but the pain went off, and afterwards a little blood only oozed out, to stop which Mr. Ruspini's styptic was got, and applied. Her state of health was very much impaired, and she was expected to lie-in every day. Under these circumstances she was brought to bed, became extremely low, the pulse sunk, and it was hoped, by those who were interested about her, that she might die. When she was in this low state, the breast and the tumour near the axilla began to mortify; and the whole surface, from the axilla nearly to the sternum, appeared like an eschar, the depth of which was not then known. Her health was still bad, but it was on the whole rather getting better. A separation took place round the edges of the dead part, and in a few days the whole dead part, consisting of the breast and tumour, came out, leaving the pectoral muscle quite bare. Her health began to mend, although slowly. Bark, porter (which she became fond of), wine, with nourishing food, were given, and a hope remained that she might recover of her general indisposition. The edges of the sore put on a very suspicious appearance; they became thick and ragged, and rather turning out, attended with extreme tenderness How far the glands of the armpit had been contaminated, though they did not mortify with the breast and tumour, was not known. While there were appearances of a possibility of a recovery of her general health, the remaining contaminated parts became an object of consideration; but, as it was impossible to ascertain the extent of the disease, and as she was too weak either to bear an operation, or any irritating applications, it was resolved to wait till her strength should recover; but the signs of recovery were not of long standing. Her strength began to fall off, her appetite failed her, the sore became stationary, looked pale, and there was hardly any discharge; nor were any granulations formed. Different parts of the body began to mortify; wherever there was a scratch, or pimple, it ran into a kind of mortification, and soon after she died."

In this case the fever produced the same effect as the preparations of arsenic used for the extirpation of cancerous breasts; but, unfortunately, did not remove all the contaminated parts, only those which were in a diseased state, and whose vital powers were so much weakened by the action of disease as to make them more readily mortify than the other parts. It is upon this principle that the arsenic acts; and this case illustrates very clearly in what way also it too often fails of entirely removing the disease."[a]

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[a] *See Hunter's Lectures: Works,* vol. I. p. 625.

e. *From Obstruction of the larger Blood-Vessels.*

141. A leg amputated on account of mortification completely extending through it, consequent on obliteration of the femoral artery near the groin. The separation of the mortified parts had commenced; and a broad and deep groove had formed in the living parts above them, nearly as high as the knee-joint. The dead integuments are brown and ash-grey in colour; and the cuticle has separated in broad layers.

The patient was an elderly lady, in whom the femoral artery was obliterated, apparently in consequence of arteritis. Amputation was performed at the lower part of the thigh, and the patient made considerable progress towards recovery, but died before the stump was healed.

Presented by G. J. Guthrie, Esq.

Other examples of mortification consequent on obstruction of the circulation, are among the specimens of hernia and intussusception.

f. *Dry Gangrene.*

142. A leg amputated below the knee in consequence of mortification of the foot and ankle. The mortified soft parts are dry, shrivelled, and black: they are separated from the living parts by a space of from one to two inches in width. The dead and the living parts are held together only by portions of the tibia and fibula, which are exposed in a state of necrosis, with deep grooves above them marking the line of separation between the dead and the living bone. The living soft parts are in great measure healed, and form a long and slender conical stump around the ends of the living bones. *From the Museum of J. Heaviside, Esq.*

The whole subject of the death of parts, and their separation when dead, is most fully illustrated by the specimens of Necrosis included between Nos. 641 and 771, in the Gallery, and between Nos. 3142 and 3213 in the Floor-Cabinets. The most characteristic specimens of the ordinary process of separation of the dead part are Nos. 641 to 655, and the best examples of the modifications to which the process is subject by peculiarities of cause, or by previous general or local disease, are Nos. 701 to 715.

SPECIFIC DISEASES.

In this part of the collection a certain number of specimens might be placed to illustrate the morbid anatomy of those specific diseases which are not included in the next series. But the appearances most characteristic of some of these diseases cannot be preserved; and, of those which can, it would not be possible to place the specimens here without detracting materially from the interest which, while arranged with other diseases of the same parts, they contribute to the several series of illustrations of special pathology. To supply, in some measure, the deficiency, the following list of references to the most characteristic specimens of the principal specific diseases here alluded to is inserted:—

RHEUMATISM, affecting bones, 562-3-4 (?), 565-6, 626; 3022 to 3030, &c.
joints, 942 to 949, 953-4-5.
the heart, 1512-3.

GOUT, affecting . . . tendons, 361-2-3.
bones, 571-2, 627-7A.
joints, 958 to 965, 972.
Probably some which are referred to under Rheumatism are examples of what is commonly called Rheumatic Gout.
. . . the integuments, 2307-8.

SYPHILIS, affecting . . bones, 559, 560, 567-8-9, 570, 628 to 637, 704-5, 714, 724; 3045-6-7, &c.; 3115 to 3135. &c.
the palate and fauces, 1072-3.
the larynx, 1835-6, 1851-2-3-4-5-6.
the nose, 2193-4-5.
the skin, 2271.
the urethra, 107; and many of the specimens of disease of the urethra.
the penis, 2591 to 2606.

SCROFULA,[a] affecting . bones, 617 to 624, 713, 975, 594-5.
joints, 885-6, 908, 928-9, 971-3-4.
the spine, 987 to 992, 996-7, 975.
lymphatics, 1463 to 1470.
the thyroid gland, 1495.
the skin, 2272.

GLANDERS, affecting . the nose, 2196-7-8.

TYPHUS, affecting . . . the intestines, 1211 to 1219 A.
the brain, 2059, 2060.

SCARLATINA, affecting the throat, 1843.

SMALL POX . . . . . . in the mouth, 1062-3.
in the pleura, ?, 1752.
in the larynx, 1844.
in the skin, 2273 to 2277.

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[a] The term "scrofula" or "scrofulous disease," is commonly applied to at least two forms of disease, of which one is characterised by the formation of the peculiar substance "tubercle," and the other, though it in some characters resembles the tuberculous disease, is not yet proved to have its origin in tuberculous formations. It may be, indeed, that nearly all the diseases which are generally called "scrofulous," derive their peculiarity from the tuberculous matter; but, till this is proved, it appears the better plan to separate the specimens of "tubercle" from those of "scrofula" in which the existence of tubercle is not evident. The specimens above referred to are therefore those of scrofula, in which there is no appearance of tuberculous matter. The specimens of tubercle are in the next series, and in the places thence referred to.

SERIES VI.—TUMOURS AND OTHER ALLIED MORBID GROWTHS.

IN the present uncertain and imperfect state of knowledge respecting the nature and differences of tumours, no arrangement of the specimens destined to illustrate them appears likely to be more useful than one adapted to the expressions which are commonly employed in reference to them. Such an arrangement is therefore here adopted.

The principal division of the series corresponds with the long-accepted division of Tumours into the Encysted and the Solid; and the solid tumours are arranged according to their presumed Innocent or Malignant nature.

Among the numerous names by which nearly every species of tumour has been or might be designated, those are selected which are in most general use, or which most plainly indicate the structure or other principal characters of the growths to which they are severally applied.

In the arrangement of the specimens of each species the chief design is to show, as far as possible, those varieties of appearance which each tumour may present without losing its more essential specific characters, and those changes of structure to which each is subject in its several stages of development or degeneration, as well as when it beomes itself the seat of disease.

Sub-Series A.—*Cysts or Encysted Tumours.*

In this sub-series are included specimens of diseases which have been described under the several generic names of cyst, primary cyst, encysted, cystic, cystoid (both simple and compound), cysto-sarcomatous, and sero-cystic, tumours; adventitious serous membranes; spurious, or false, hydatids; encysted dropsy; hygroma; wen.*

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* This sub-series does not include examples of what have been called "secondary cysts," by which are meant such investments, cysts, or capsules, as are formed around solid tumours and other bodies imbedded in the tissues. Such cysts are called "secondary," because their formation is supposed to be always consequent on that of their contents; while the true or "primary" cysts are usually supposed, in all cases, to exist before, and to produce, their contents. Examples of such secondary cysts or capsules investing solid tumours are shown in Nos. 195, 207, 209, &c.; the cysts around hydatids are analogous formations [see Nos. 1132-3-4-7, 1420 to 1425, 2085, 2089, and others]; and the cysts formed around bodies introduced from without are not essentially

It is very probable that many of these diseases are morbid enlargements of a naturally existing part, such as a hair-follicle or a portion of a gland-duct, and that they might therefore be placed among the diseases of the parts which they affect more properly than among tumours. But, in practice, many of these cysts are regarded and treated as tumours; and some, commencing in enlargement of a gland-duct, are, by growths within them, converted into solid tumours; therefore some specimens of them are placed here, and others among the diseases of the organs which they severally affect; and the disadvantage which might result from the separation of similar specimens is remedied by the insertion of mutual references.

1. *Simple Cysts, with Serous or other Liquid Contents.*

[Serous Cysts; Simple Adventitious Serous Membranes; False Hydatids; Hygroma; Meliceris; Blood-cyst.]

143. Choroid plexuses, on which there are many groups of small transparent membranous cysts containing a pellucid fluid. *Hunterian.*

144. A similar specimen; but the cysts are smaller and less numerous. *Hunterian.*

145. Part of a kidney, with a thin-walled membranous cyst nearly two inches in diameter, half imbedded in its substance, and half projecting from its surface. That part of the wall of the cyst which is imbedded in the kidney is fasciculated and folded in consequence of the unequal resistance offered to its growth. The adjacent surface of the kidney is granulated. *Hunterian.*

146. A large thin-walled cyst removed from the front of the neck and chest.

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different [see Nos. 59, 60, 61]. It is to be observed, however, that the distinction between primary and secondary cysts cannot be certainly or generally admitted: for even if it were proved that the formation of a cyst ever precedes that of its contents, yet the descriptions of the cysts containing vascular growths, or sero-cystic tumours, show, that that which at one time would be regarded as a primary cyst containing and producing fluid, may, at another stage of its existence, assume the characters of a secondary cyst investing, and growing with, a solid tumour.

In its present collapsed state it is upwards of six inches in diameter. It lay between the *platysma myoides* and the *sterno-mastoid* muscles, parts of both of which are attached to its surface; and a portion of it was behind the clavicle. Its walls are thin and flaccid, apparently composed of fibro-cellular tissue. It was filled with a clear brownish fluid.

Presented by Thomas Blizard, Esq.

147. A large cyst removed from the thigh of a woman who was a patient in St. George's Hospital. The cyst is of an oval form, and, though partially collapsed, measures nine inches in one diameter, and six inches in another. Its walls are tough and compact, and almost uniformly about a line in thickness; at one part it is covered by skin, to which, as well as to the other adjacent textures, it appears to have been loosely attached by fibro-cellular tissue. Internally it is smooth and polished, but a little wrinkled by having collapsed. *Hunterian.*

148. An os hyoides, with a round, thick-walled, membranous cyst more than two inches in diameter, attached to the posterior surface of its body. The cyst was loosely connected to all the surrounding parts, and full of brownish yellow, thick, grumous, honey-like fluid, containing abundant crystals of cholestearine.

From a sailor between 50 and 60 years old, in whom it had existed nearly as long as he could remember. It was covered by the sterno-hyoid muscle.

From the Museum of Robert Liston, Esq.

149. The front of a woman's pelvis, with a large cyst filling up the thyroid foramen, and projecting both externally, and into the cavity of the pelvis. The cyst has a somewhat oval form, and is in different directions from three to five inches in diameter; its walls are of various thickness, from a line to nearly half an inch, and composed of a dense tough tissue. Its outer surface is nearly smooth; internally it is uneven and rough.

It originated in the effects of a kick on the part, and produced great distress.

From the Museum of John Howship, Esq.

150. An apparently healthy testicle, with a thin-walled, transparent, and nearly globular, membranous cyst three quarters of an inch in diameter, attached to the middle of the posterior margin of the epididymis. The cyst appears to have lain within the spermatic cord, the constituents of which are partially expanded around it. It has the usual characters of cysts in which seminal fluid is contained.

From the Museum of Sir A. P. Cooper.

The preparation is figured in Sir A. P. Cooper's 'Observations on the Structure and Diseases of the Testicle.' Part II. pl. xiv. fig. 2. London. 1830, 4to.

In No. 2459 is some fluid from a cyst of the same kind which contains spermatozoa.

151. Part of a breast, in which the mammary gland appears rather consolidated, and exhibits on its cut surface a very large number of oval and round, simple and multilocular, smoothly walled, and well defined cysts, formed probably by dilatations of parts of the lactiferous tubes. They vary in size from a line to more than half an inch in diameter; the walls of some of them are separable from the surrounding substance of the indurated gland, and are thin and transparent.

From the Museum of Sir A. P. Cooper.

152. Part of a mammary gland, in which there are three simple oval cysts with thin membranous walls and smooth internal surfaces. One of them, in great part dissected out from the surrounding glandular substance, is nearly an inch in its longest diameter. They probably had their origin in partial dilatations of the lactiferous tubes.

From the Museum of Sir A. P. Cooper.

Specimens of simple Cysts with Serous or other liquid contents in other parts of the Museum:—

Adventitious bursæ, 4, 368, 2312.
Cysts in the lower jaw, 1033.
    in the peritoneum, 1121,? 1122.?
    in the thyroid gland, 1498, 1502, 1503, 1504.
    in the kidney, 1895 to 1903.
    in the membranes of the brain, 2121, 2122.
    in the choroid plexus, 2148.
    connected with the testicle, epididymis, or spermatic cord, 2337, 2354, 2355, 2358? to 2361? 2442 to 2445, 2448 to 2450, 2456 to 2459.

Cysts in the prostate gland, 2510.
    in the ovaries, 2617 to 2620.
    connected with the Fallopian tubes, 2647 to 2652.
    in the uterus, 2657. ?
    in the mammary gland, 2749 to 2753; and compare with these 2744 to 2748.

2. *Cysts containing Air.*

153. A portion of the rectum of a hog, of which the peritoneal coat is in many places, and especially by the sides of the meso-rectum, covered by groups of thin-walled, transparent, membranous cysts, attached by pedicles, or having broader bases, and containing air. *Hunterian.*

154. A similar portion of intestine with cysts containing air, dried. *Hunterian.*

No. 153 is engraved in Pl. xxxvii. of Hunter's Works, and is described as "A portion of intestine of a hog, the peritoneal coat of which is covered in several places with small pellucid cysts containing air. It was sent to me by my friend Mr. Jenner, surgeon, at Berkeley [afterwards Dr. Jenner], who informed me, that this appearance is found very frequently upon the intestines of hogs that are killed in the summer months." And in the "Observations on Digestion" (*Works*, vol. iv. p. 98), Mr. Hunter says (to illustrate the fact, "that air is either formed from the blood, or let loose by some action of the vessels, both naturally and from disease")—"I have a piece of the intestine of a hog which has a number of air-bladders in it. Mr. Cavendish was so kind as to examine this air, and he found 'it contained a little fixed air; and the remainder not at all inflammable, and almost completely phlogisticated.'"

3. *Cutaneous Cysts; Cysts containing cuticle, sebaceous matter, hair, or other products or appendages of Skin.*

[Including the Cuticular Encysted Tumours of Hunter; the Adipose Cysts of Müller; Steatoma, and Atheroma.]

"Incysted tumours differ exceedingly among themselves, both in the nature of their contents, and in their progress towards the external surface of the body. [See Nos. 120, 121]. Many of them have no reference to our present purpose; it is only the more indolent kind to which I mean now to advert: some of these, when examined, are not found to contain a fluid, but a small quantity of thick, curd-like matter, mixed with cuticle broken down into small parts; and upon exposing the internal surface of the cyst, it is found to have a uniform cuticular covering adhering to it, similar to that of the cutis on the surface of the body, from which it only differs in being thinner, and more delicate, bearing a greater resemblance to that which covers the lips.* Others of this kind, instead of having cuticle for their contents, are filled with hair mixed with a curdled substance, or hair without any admixture whatever, and have a similar kind of hair growing upon their internal surface, which is likewise covered with a cuticle."...

"That the lining of the cyst really does possess powers similar to cutis, is proved by the following circumstances: that it has a power of forming a succession of cuticles like the common skin; and what is thrown off in this way is found in the cavity of the cyst. It has a similar power respecting hair, and sometimes the cavity is filled with it—so great a quantity has been shed by the internal surface. Besides these circumstances, the hair found in the cyst corresponds with that which grows upon the body of the animal; and when incysted tumours of this kind form in sheep, they contain wool. What is still more curious, when such cysts are laid open, the internal surface undergoes no change from exposure; the cut edges cicatrize, and the bottom of the bag remains ever after an external surface. Different specimens, illustrative of the above-mentioned circumstances, are preserved in Mr. Hunter's collection of diseases."—*Observations on certain Horny Excrescences of the Human Body: by Sir Everard Home, Bart., from materials furnished by Mr. Hunter. In the Philosophical Transactions*, vol. lxxxi. p. 95: *and in Hunter's Works*, vol. iii. p. 635.

The great majority of the cysts of this kind are found either in the skin or in the ovaries. In the former case it is nearly certain that they have their origin in diseases of the hair-follicles. The orifice of a follicle becoming obstructed, its cavity is gradually filled by the epithelium and hair (or one of them), which continue to be formed and shed in it, and by the sebaceous secretion of its walls and of the adjacent glands. These substances (any of which may be variously altered in consequence of the disease of the follicle) accumulate; the follicle distended by them grows; its walls become thicker, acquire a more highly organised texture, and assume the character of a distinct cyst.

When similar substances are found in ovarian cysts, they are probably always formed on a part of the cyst-wall which has the structure of true skin, with a cuticular surface, hair-follicles, sebaceous, and sometimes perspiratory, glands. [See 164 A.]. The structures and secretions formed on this portion of the cyst are shed into its cavity, and there accumulate; and they remain when, as often happens, the cutaneous structure on which they were produced has degenerated and disappeared.

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* "The surface of the internal coats of these tumours has a skin somewhat like that which covers the glans penis, different in some respects from that with which the rest of the body is furnished, but not of such a nature as to suppurate on exposure."—*Hunter's Lectures; Works*, vol. i. p. 576.

155. "A small [encysted] tumour placed immediately under the skin, extracted at St. George's Hospital. A little of the skin remains on the tumour, and the inner side of the tumour is opened, showing its contents, which were principally a series of cuticles thrown off."—*Hunterian MS. Catalogue.*

156. "An encysted tumour taken from the breast of Mr. Waters, filled with a flaky substance which seemed to be a succession of cuticles, being the same with that which lines it."—*Hunterian MS. Catalogue.*

157. The contents of a cyst from a boy's throat. They consist of flakes of a whitish soft substance, together with a considerable number of small spherical yellowish bodies, like the ova of an insect. Both these, and the softer amorphous substance, are chiefly composed of fatty and sebaceous matter. *Hunterian.*

157 A. A globular cyst three inches in diameter, removed, with the skin covering it, from the back of the neck. The walls of the cyst are from half a line to a line in thickness, and of a compact tough texture; it was filled with "a soft cheese-like substance," and its inner surface is covered by adherent masses of a substance like hardened and half-dried sebaceous matter. In the pedicle of skin by which this cyst was attached to the patient's neck there is another of the same kind, but much smaller.
Presented by Sir William Blizard.

158. A small, thin, tough-walled cyst, removed from beneath the eyebrow of a man at St. George's Hospital. It has been inverted to show several pale slender hairs, like small eye-lashes, growing from a part of its inner surface, which is wrinkled, and bears much resemblance to a surface of skin. Its cavity was filled with a *cheesy* substance. *Hunterian.*

159. A thin-walled cyst from a sheep, full of wool imbedded in fatty matter.
Hunterian.

160. Another similar cyst from the same animal. A cylindrical prolongation from the chief cavity of the cyst, about five inches in length and an inch in diameter, extended down the thigh, and is filled, like the rest of the cyst, with balls of wool and fatty matter impacted together and flattened into spheroidal shapes by their mutual pressure. *Hunterian.*

161. A cyst filled with light hair, matted together with calcareous and fatty substances into a compact and firm mass like mortar. It was removed from the shoulder of a cow which had six legs. The walls of the cyst are dense, a line in thickness, and in texture like skin. *Hunterian.*

162. Another similar cyst from the shoulder of the same animal. It contains several balls of matted light-brown hair. A tuft of hair is shown growing from a recess in its internal surface, from which also portions of thin transparent cuticle have been reflected. *Hunterian.*

163. A large cyst removed from beneath the integuments of the shoulder of an ox, and partly inverted. It was filled with long slender black hairs, mingled with a fatty substance. Its internal surface is dark grey and black, exactly like the outer skin of the animal, and has black hairs growing on it. *From the Museum of George Langstaff, Esq.*

164. An uterus, with a portion of the wall of a large ovarian cyst adhering to it. On the interior of the wall of the cyst a smaller cyst is attached, which is full of a yellow, granular, fatty substance, mixed with numerous, pale, stiff hairs. *From the Museum of John Heaviside, Esq.*

164 A. A small portion of an ovarian cyst. Part of its inner wall presents a layer exactly resembling the external skin, with distinct cutis, subcutaneous fat, epidermis, and close-set hair follicles with pulps and sebaceous glands. Fine dark hairs project from the follicles. Beneath this layer, imbedded in the wall of the cyst, is a small portion of hard bone. Another portion of the ovarian cyst contained a large quantity of hair matted together with a fatty substance like butter. Other portions are preserved in Nos. 165 A and B. *Presented by James Paget, Esq.*

165. Several fine hairs an inch long, and of various colours, "from a fistula formed on the os coccygis"—most probably from a fistulous passage remaining after the opening or incomplete removal of a cutaneous cyst.
Hunterian.

Specimens of Cysts, containing Fatty Matter, Hair, &c., in other parts of the Museum:—

In the kidney, 1904.
In the skin, 2291 to 2299.
" with horny growth, 2300.
In the ovaries, 2624 to 2632.
In the breast, 2754 to 2757; which are probably examples of cholesteatomatous cysts.

4. *Compound Cysts; Cysts having others on their Walls.*

[Including most of the Compound Cystoid Growths, of Müller,* and of the Compound Serous Cysts, or Compound Adventitious Serous Membranes, of Dr. Hodgkin; including also most of the Multilocular Cysts which occur in the Ovaries.]

The peculiar characteristic of the cysts of this species is, as Dr. Hodgkin has defined it, "the production of more or less numerous clusters of cysts, arising from different points, on the interior of the superior cyst."† The following specimens, and those in Nos. 2621, 2622, 2623, and 2625, among the diseases of the ovary, illustrate the three varieties into which, as Dr. Hodgkin has shown, the species may be divided, as well as some of the gradations of form between those by which the several varieties are characterised.

In one variety, the secondary or endogenous cysts are attached to the walls of the "superior," primary, or parent cyst by broad bases [as in 2622 and 166]; they project but little into its cavity, and may only produce an appearance of a circumscribed thickening of the portion of its wall on which they are seated. In another variety, which is the opposite of this, clusters of endogenous cysts, of various size and form, are attached by narrow, single, and branched peduncles, from which they gradually or suddenly dilate [as in 2621, 2623, and in parts of 165 A, B]. The third variety presents a form and arrangement of endogenous cysts intermediate between those which are characteristic of the two other varieties.

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* Ueber den feinern Bau und die Formen der krankhaften Geschwülsten. Berlin, 1838. Folio, p. 54.

† Lectures on the Morbid Anatomy of the Serous and Mucous Membranes. London, 1836. 8vo. Vol. i. p. 232.

In the variety with broad-based cysts, the secondary cysts (or endogenous cysts of the second order) commonly contain tertiary cysts (or endogenous cysts of the third order) like themselves, and growing from their walls as they grow from the walls of the primary cyst. In the intermediate variety, also, the secondary cysts usually contain tertiary cysts like themselves. In the pedunculated variety the clusters of cysts may grow from the inner surface of the primary cyst [as in 2621], but more frequently they grow from the interior of secondary cysts.

Moreover, among the specimens of each of these varieties, various appearances are produced by the different sizes of the endogenous cysts; by their being more or less crowded, or by their more or less completely filling the cavities of those in which they grow; by their mutual pressure, and consequent change of form or texture; and by the union of their walls when they are crowded together [as in 165 B]. Other peculiarities arise from the varieties of the contents of the cysts: the contents, too, besides their original differences, may be modified by rupture or by inflammation of the cyst-walls; and by the latter event, the cyst-walls may also themselves be altered by lymph being deposited and organised upon them [as in 165 A, B].

The forms and sizes of the pedunculated cysts are extremely various, and transitional forms may be traced from groups of the most slender of them to groups of filaments, or of narrow, pedunculated, solid growths, by which [as No. 170 shows] a connexion is established between this and the next species of cysts—the cysts which produce solid growths from their walls, and through which, as Dr. Hodgkin has shown, there is a direct transition to certain forms of solid tumours.

165 A. Portions of one of the divisions of a large multilocular compound cyst from an ovary. Attached to the inner wall of the chief or parent cyst, by narrow bases or by pedicles, are numerous thin-walled cysts containing a pellucid reddish or yellow fluid. Within these cysts of the second order, some of which are laid open, there are numerous other cysts of a third order, smaller, more delicate, but similarly attached to the walls of their parent-cysts, and filled by similar fluid. The cysts of the third order nearly fill the cavities of those of the second order: some of them, closely pressed together, have lost their round shape, and have acquired, by mutual compression, flattened sides: their walls are all pellucid and vascular. The cysts of the second order did not fill that of the first order; but some of them are close-set, and mutually compressed.

Their walls, also, are pellucid and vascular; but were completely covered by lymph, produced by inflammation of their surfaces and of the interior of the cyst, and spread out over them in a thin, coarsely-granulated, and adherent layer. The rest of the cavity of the parent-cyst was filled by a thick, glutinous, bloody-coloured fluid, mixed with lymph and serum.
Presented by James Paget, Esq.

165 B. Portion of another division of the same cyst, in which, by sections through cysts of the second order, it is shown how their cavities are filled by cysts of the third order, springing from their bases or from many parts of their walls; and how, by the mutual apposition and compression of these tertiary cysts, their walls coalesce, and acquire the appearance of partitions converging or radiating, and dividing the chief cyst into many chambers.

166. An uterus, with the Fallopian tubes and ovaries. In the place of the right ovary there is a large compound cyst, with tough, compact, and obscurely laminated walls from half a line to three lines in thickness. Both surfaces of the walls of this cyst are smooth and polished. To its inner surface are attached by broad bases, many smaller cysts, of various sizes, and variously grouped and accumulated. Some of these are preserved in their original nearly globular form. From some, portions of their walls have been cut away, exposing other smaller cysts within them. The walls of the cysts of the second and third orders are thinner than those of the principal enclosing cyst, but of similar tough and compact texture, and equally smooth on both their surfaces. The principal cyst appears to have been completely filled by these minor endogenous cysts. *Hunterian.*

5. *Cysts containing Vascular Growths from their Walls.*

[Sero-cystic Sarcoma, of Brodie;* including some forms of the Cysto-sarcoma phyllodes, and the Cysto-sarcoma proliferum, of Müller; included among the Compound Serous Cysts, by Dr. Hodgkin.]

These cysts do not apparently differ, so far as their own characters are concerned, from the simple cysts containing serous or other fluids; and many of them, especially of those which are seated in the mammary gland, have probably a like origin in the distension and growth of obstructed ducts. Their peculiarity is derived from the production of solid vascular growths from the interior of their walls, which growths, imitating in their progress the secondary cysts displayed in the last section, project into, and may at length fill, the cavities of the cysts. The various characters and progress of these growths are explained in the descriptions of the following specimens, and of a nearly corresponding group of specimens placed with the diseases of the Breast [No. 2758 to 2771]. Both the groups are so arranged as to show the gradual transitions from the simple serous cyst to that in which one or more endogenous growths have filled the cavity of the cyst, and then, coalescing with its walls, have assumed the form of a solid tumour.

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* "Lectures illustrative of various subjects in Pathology and Surgery." London. 1846. 8vo. p. 137.

The similarity between the solid growths which are most often thus formed in cysts, and the tumours of the fibro-cellular species, is so close, as to make it probable, that all of this species may have a like origin in intra-cystic growths; although, where the solid part of such a growth has continued to increase long after the union of its surface with the interior of the cyst-wall, scarcely a trace of the original cystic character may be discerned. The similarity here referred to may be seen in a comparison of 176, 177, and 178, with 209, 210, and 211. When thus the surface of the growth and of the cyst are united, the cyst commonly remains as a kind of fibro-cellular capsule to the growth, investing it in the same manner as the "secondary cysts" [see page 62, foot-note] invest certain tumours which have been solid from the first, such as No. 195 and others.

There are some examples of medullary and other species of tumours growing within cysts [see No. 2396, in which the structure of a medullary tumour is very similar to that of some of the nearly solid tumours of cystic origin]; and it is possible that, as Dr. Hodgkin believes, many of the solid tumours of other kinds besides the fibro-cellular may have a similar cystic origin. If it be so, the following specimens will be sufficient to illustrate the progress not only of the species of which they are themselves examples, but also of any other tumours which are at first developed in cysts, and afterwards assume the solid form.

It is further to be observed that, as solid growths may thus be formed within cysts, so also cysts may be formed within solid growths: [as in 216, 222, 234, 803, 1908, and others]. The occurrence of these cysts in tumours may be in some instances explained by supposing that, in a group of cysts, some have retained their simple character, while others around them, after being filled by solid growths, have coalesced and assumed the form of the solid tumour [see Nos. 173, 174, 176); but in many instances there is no evidence for this explanation.

However generated, such cysts in solid tumours may contain merely serous or other fluids, or they may have vascular growths from their inner surfaces, the progress of which growths may imitate that which is illustrated in the following group of specimens. In the former case they constitute the cysto-sarcoma simplex, in the latter the cysto-sarcoma phyllodes, of Müller.

167. A cyst containing several lobulated growths, which was removed from the cheek of an aged woman at St. George's Hospital. The cyst is globular in form, and about three inches in diameter; its walls are a line in thickness, and formed of tough and, apparently, fibro-cellular tissue; externally it appears to have been closely connected with the adjacent parts; internally, its walls, where no growths are attached to them, are uneven and superficially tuberculated, but have a polished surface. The lobulated growths are numerous, and of various sizes; some are attached by broad bases; others, including the largest, have long and slender cord-like pedicles; they are all composed of a pale soft substance. *Hunterian.*

168. Part of a breast, in which, just below the nipple, there are two cysts separated by a thin membranous partition. They are of oval form, and appear to have been about an inch and a half in diameter; they have distinct thin membranous walls, with polished internal surfaces. At the part nearest to the nipple there protrudes into the cavity of each of these cysts a coarsely-lobed and granular growth of soft substance, like a mass of granulations. Both the growths have broad bases of attachment to the walls of the cyst, and their free surfaces are convex and deeply fissured. *Hunterian.*

169. Part of a cyst removed from a breast, with the integuments and nipple over it. Its walls are a line or more in thickness, and tough; its inner surface is uneven, tuberculated, and coarsely fasciculated. Two growths of the same soft, lobed, warty and fissured aspect as those in the preceding preparation, are attached to the interior of the cyst; but their bases are not so broad as those last described. They fill a considerable portion of the cavity of the cyst. The rest of the cavity appears, by the colour of its internal surface, to have contained a dark fluid. At the upper part of the

specimen there is another cyst, small, oval, with thin membranous walls, and empty; and at the lower and back part, another of like characters, but nearly filled by a soft lobulated growth.

From the Museum of Sir A. P. Cooper.

170. Section of a breast, and of a large membranous cyst imbedded in it. The cyst is of a flattened oval shape, and between two and three inches in diameter. In its general aspect it resembles the thin-walled cysts in No. 168, and its cavity is filled by a soft growth from its walls, of the same kind as those last described, but much more minutely and variously lobulated. The lateral walls of the cyst have been cut away, and the growth is displayed, protruding from the cavity thus laid open, in the form of bunches of small, flattened, obtuse, leaf-like, pedunculated, vascular processes, of various size and closely grouped. Some of the masses thus composed are attached to the walls of the cyst by slender pedicles, others by broad bases. The nipple is situated above and by the side of the cyst, and is rather deeply retracted towards it.

From the Museum of Sir A. P. Cooper.

The other section of the breast, showing several other smaller cysts with similar growths, is preserved in No. 2765.

171. Section of part of a breast, and of the subjacent pectoral muscle. Just beneath the skin there are several distinct, small, thin-walled, membranous cysts like those already described, and each nearly filled by a similar lobulated, warty, and *cauliflower-like* growth from some part of its wall. The subjacent muscle and the surrounding textures are all healthy. The cysts are chiefly situated below and near the nipple.

From the Museum of Sir A. P. Cooper.

172. Section of a breast, in which is a large oval tumour formed by a congeries of cysts filled by lobulated growths. The largest of the cysts is spherical, two inches in diameter, with thin tough walls. It is completely filled by a growth, which now protrudes from it, as if liberated from the pressure of the walls by which it was enclosed and which itself had distended. The surface of this growth is not, in any part displayed by the section, ad-

herent to the interior of the cyst, though they are in close contact. Its texture is pale, nearly white, opaque, and apparently uniform,—almost like coagulated albumen. It is composed of many lobes or portions variously shaped, but all closely packed together; so that, till they were artificially separated, the growth probably appeared solid and nearly uniform. All the other cysts have the same character as this largest one: they are from half an inch to an inch in diameter, and are all similarly filled by growths. Between them there intervenes a small quantity of tough dense tissue, by which they are united into one nearly solid mass, and which the injection of the blood-vessels shows to be more vascular than the encysted growths. The substance of the mammary gland, in which the tumour is imbedded, and all the adjacent tissues, appear healthy.

From the Museum of Sir A. P. Cooper.

The other half of the specimen is preserved in No. 2768.

173. Section of a similar but smaller tumour of the breast, in which the cysts and their contained growths are still more closely and uniformly packed, so that the mass they form appears more nearly solid. The same component structure of the tumour may however be discerned. It consists of several thin-walled cysts, some round, some apparently multilocular, some pressed into various irregular shapes. All these are filled by lobulated or branching foliated growths of a pale but vascular substance, with a nearly uniform firm texture. The growths appear to be attached to the walls of the cysts in various manners, some by pedicles, some by broad bases. Their surfaces are everywhere in contact with the walls of the cysts, and in a few places they appear united.

From the Museum of Sir A. P. Cooper

174. Section of a large tumour, with a portion of the superjacent integuments of the breast and the nipple somewhat retracted. The tumour, though it appears at first sight uniformly solid, is evidently of the same kind and origin as those last described; for on some parts of the section, especially at the back of the preparation, many cysts like those in the preceding specimens may be traced, filled by lobulated and foliated growths, yet

having distinct walls. One such cyst, also, has been partially dissected out, and projects on the front surface of the section; and just beneath the integuments near this part there is one small oval cyst (like some of those in Nos. 170, 171), with a smooth internal surface, and having only one-fourth of its cavity occupied by a growth from a portion of its wall. Most of the cysts and their contained growths have, however, so coalesced, that the tissue which formed the walls of the cysts appears on the surface of the section only like thin waving and circling partitions between the several portions of a uniform solid lobulated tumour; but the comparison of the direction of these partitions with that of the more distinct walls of the cysts in the two preceding specimens, and of the general arrangement of the lobules and other smaller parts of even the most solid portions of this tumour with that of the growths within the cysts in them, will show that the differences between them depend only on the degrees of compactness which their similar constituents have attained, and the extent to which they have coalesced. *From the Museum of Sir A. P. Cooper.*

175. Section of a breast, in which is a large tumour presenting the same general characters as those just described. It is formed by a collection of cysts, most of which are filled by lobulated growths; but some contain a more uniform and solid substance, and some, which contained fluid, are now empty. A part of the tumour has protruded through the integuments; and some of the intra-cystic growths in this part have protruded through their cysts in a soft mass with a granulated surface. The integuments around the protrusion are healthy.

The patient was a florid healthy-looking woman, fifty-one years old. She had had ten children, four of whom she suckled from the breast in which this tumour was seated. The tumour first appeared nineteen years before it was removed. Its origin was ascribed to the bruising of the breast by severe pressure against a mattress during the patient's first confinement. Soon after this, a lump "as large as a teacup" formed. Five or six years later the breast began to enlarge, and thenceforward gradually increased. When the patient was first seen by Mr. Johnson, the tumour measured thirteen and a half inches in its vertical diameter, and eleven inches in its transverse diameter. Its surface was irregular and firm, except above the nipple, where in one part fluctuation was felt. It was very heavy. The skin was adherent to the greater part of its anterior surface, and about the centre was dusky red, and covered with scales; but the tumour was moveable on the pectoral muscle. It was not painful, except after being handled; and the axillary glands were not enlarged.

An attack of sore throat and fever delayed for a time the removal of the breast; and during the recovery of the patient from this illness, the dark-coloured patch of skin gave way, and a fungous growth protruded through the opening. When removed, the tumour weighed nearly seven pounds. The patient was in good health two years after the operation.

Presented by Henry James Johnson, Esq.

176. Sections of a small round tumour in a mammary gland. The surface of the tumour is distinctly defined, and loosely connected with the adjacent textures. Two-thirds of it resemble the more solid parts of Nos. 173, 174, being composed of a pale compact substance, with an obscure appearance of short white bundles of fibres, traversing, in wavy lines and circles, a homogeneous and somewhat glistening basis. The other third is made up of small leaf-like pedunculated growths filling cysts, from which some have been everted, and in which the others are so tightly packed that they form a nearly solid and uniform substance resembling that of the rest of the tumour. The exterior of the tumour is invested by a thin fibro-cellular capsule, and the adjacent tissues appear healthy. *Hunterian.*

177. Sections of a small tumour in a breast, the whole of which is composed of growths crowded in a cyst like those in the smaller portion of the preceding specimen. It was described by Mr. Hunter as "a tumour in the breast neither cancerous nor scrofulous, completely distinct, and of a separate structure from the surrounding parts,"—[*Hunterian MS. Catalogue*]—a description which, as in the case added to No. 264, he elsewhere applies to medullary cancer.

178. Section of a breast in which, directly under the nipple, there is a small solid tumour very like that last described. The nipple is drawn in so that its point is lower than the level of the surrounding skin. Behind, on the outer side of this tumour, and in contact with it, there are sections of three or four distinct cysts, one of which is nearly filled by a soft lobulated growth. *From the Museum of Sir A. P. Cooper.*

Other specimens of cysts, with solid growths from their walls, are among the illustrations of diseases of the breast, from 2758 to 2771; and Nos. 216, 234, 2388, 2389, 2390, 2392, are specimens of cysts containing solid growths from their walls, and themselves imbedded in solid tumours.

6. *Cysts of which the Contents are of uncertain Nature.*

179. A tongue, to the inferior part of which, in the middle line, about three inches from its apex, a globular thin-walled cyst, an inch in diameter, is attached. The exterior of the cyst appears to have been loosely connected with the adjacent parts. Its inner surface is smooth; and it is filled with a yellowish substance like hard-boiled yelk of egg. One half of the cyst has been emptied. *Hunterian.*

180. "A scrofulous tumour" [*Hunterian MS. Catalogue*]; consisting of two large empty cysts, on the breast of a young bird.

7. *Various contents of Cysts.*

181. "Oil from an adipose encysted tumour."—*Hunterian MS. Catalogue.*

8. *Cysts with Bone-like or other Deposits in their Walls.*

182. A portion of a cyst from a sheep, dried, with nodules of bone-like substance in it. *Hunterian.*

183. Sections of a cyst, of which the greater part of the walls is formed by thick uneven plates of bone-like substance. *Hunterian.*

184. A cyst dried, and having plates of bone-like substance in its walls. It contains three granulated masses of a similar substance, lying loose in its interior. *Hunterian.*

SERIES VI.—Sub-Series B.—*Solid Tumours.*

THE species of tumours in this sub-series are placed in an order determined, as nearly as the present state of knowledge will permit, by the degrees of resemblance which, in their fully developed state, their structures bear to the natural structures of the body. The species described are—1. The adipose tumour; 2. The cartilaginous and osseous; 3. The fibro-cellular; 4. The fibrous and fibro-calcareous; 5. The osteoid; 6. The epithelial; 7. The scirrhous tumour, or hard cancer; 8. The medullary, or soft cancer; 9. The alveolar, or gelatiniform cancer; 10. The tubercle. In an Appendix (A.) are placed tumours of uncertain nature, including all those to which, for various reasons, no specific name can be certainly applied; and in a second Appendix (B.), the tumours which are found pendulous or loose in the cavities of the body, these being separated and grouped because of the interest which they derive from their peculiar situation, and from the importance which Mr. Hunter attached to them as illustrations of the general pathology of tumours.

This arrangement of the species of solid tumours corresponds with their accepted practical division into innocent and malignant tumours. The characters which, in indicating this distinction, are here taken as the principal marks of malignant growths are these:—1. Their structure is not like that of any of the fully-developed natural structures of the body, nor like that which is formed in any natural process of repair. 2. They may have the character of *infiltration*, *i. e.* their elementary structures, instead of being collected in a mass, distending and separable from the tissues in which it lies, may be diffused or infiltrated in the interspaces and cavities of those tissues; so that, at least in its early state, the tumour or growth may consist of its own proper elements mingled with those of the tissue in which it is formed, and which degenerates and disappears as the morbid growth increases, and, as it were, overwhelms it. 3. They exhibit a peculiar tendency to soften, and then to ulcerate. 4. The ulcer which succeeds to a malignant growth has no apparent disposition to heal; but a morbid substance, like that of which the original growth was composed, is formed in the walls of the ulcer; and as this substance passes through the same changes of softening and ulceration which the primary growth passed through, so the malignant ulcer extends, and makes its way through tissues of all kinds. 5. Malignant growths not only enlarge, but, apparently, multiply or propagate themselves, so that, after one has existed for some time, others like it grow, either around it in widening circles, or in parts remote. The reproduction of malignant tumours, after their removal by surgical operation, may be regarded as an example of this characteristic tendency to numerical increase. 6. In this multiplication, as well as in the progress of ulceration, of a malignant disease, there is scarcely a tissue or an organ which the same disease may not invade.

Assuming these as the characters of malignant growths, the first three of the ten species enumerated above are not malignant tumours; the last four are malignant; the fourth sometimes presents at least one character of malignancy in its tendency to return after removal by operation; the fifth has not only the same character in a greater degree, inasmuch as it usually returns after removal, and is often produced in many parts remote from its primary seat, but it also assumes, in many cases, the character of infiltration; and the sixth has the character of malignancy in its constant tendency to ulcerate, and, in ulcerating, to extend in every direction almost irrespective of the tissues it invades. These three species, therefore, presenting certain signs, but not the highest degree, of malignancy, and thus corresponding with what some have described as semi-malignant diseases, are placed after those in which no malignant character is discerned, and before those in which every such character is seen.

The examples of some of these species of tumours are further divided and arranged as subordinate varieties of the several species.* These will be noticed in their appropriate places.

1. *Fatty Tumours.*

[Adipose Tumour; Adipose Sarcoma; Lipoma, including the Lipoma simplex, L. mixtum, and L. arborescens, of Müller.]

The fatty tumours, in their structural and chemical composition, differ in no material respect from the common fat or adipose tissue of the animal in which they grow. They are of so simple and low-organised a structure that their occurrence in any incompletely developed state is unknown. Neither do they appear to be subject to any process of degeneration, independent of inflammation or other disease excited in them. In case of disease they may suppurate, slough, or become indurated, in the same manner as the natural adipose tissue may.

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* It is perhaps necessary to observe that by the term "species," as here and elsewhere employed, it is not meant that those which are spoken of as distinct species of disease are as certainly different in nature as the several species of plants or animals are presumed to be. It is only meant that the most frequent or well-marked examples of each of the "species" of tumours and other diseases are so far distinguishable from each other, that they may be grouped and arranged on a plan analogous to the classification of the species of organic beings. So, also, where "varieties" of diseases are spoken of, it is not meant that each variety deviates, in certain particulars, from the determinate characters of the species to which it belongs; but that in each kind or species of tumour or other disease, the specimens may be arranged in groups as so many "forms" or "varieties," each possessing certain (it may be accidental) characters by which, while retaining the more general characters of the "species," it differs from the rest.

According to their differences in certain subordinate characters, the fatty tumours might in several ways be divided into two or more forms or varieties. Thus, some are simple and uniform [187, 189, 194]; others are more or less deeply lobed, even so that one may appear like a congeries of tumours [186, 188, 192]; and others, seated very near the surface of the skin or some internal cavity, become pendulous as they grow [189, 191, 194]. Such varieties might be named respectively the *simple*, the *lobulated*, and the *pendulous* variety. Or, while in most fatty tumours the fibro-cellular tissue which supports the fat-cells and partitions them is sparingly arranged, delicate and loose, there are some in which it is more abundant, thick, and tough; and these, which probably comprise many specimens of what have been termed *lardaceous tumours*, have been included by Müller, as a variety of the species, under the name of *Lipoma mixtum*—the name implying that they combine characters belonging to both the fatty and the fibrous or fibro-cellular tumours. Or, again, according to their several modes of investment,—most fatty tumours are invested and separated from the adjacent tissues by a layer of fibro-cellular tissue; but some have no such distinct boundary, and some are enclosed in a double layer of membrane, like an organ in a serous cavity.

185. A large flat fatty tumour, uniform in its substance, and with a deeply-lobulated outline. It was removed from a woman's shoulder, and is a characteristic specimen of the most common form of fatty tumour. There is an imperfect cicatrix on the skin covering the tumour, as if some escharotic had been applied.

The patient's breast had been removed about twelve months before the removal of this tumour, for what was considered to be scirrhus.

Presented by Sir William Blizard.

186. A large fatty tumour, divided into several lobes, all smooth on their surface, and all closely packed together so as to form a regularly oval mass.

It was removed from above the breast of a young woman.

Hunterian.

187. Section of a large fatty tumour removed from the back. It appears firmer than the preceding, and consists, like it, of many closely packed lobes.

Hunterian.

188. A fatty tumour removed from the neighbourhood of the anus. It is so deeply lobed that it looks like a cluster of distinct tumours.

Presented by Sir William Blizard.

189. An oval tumour, nearly five inches in diameter, removed from the inner side of a man's thigh. It is composed of firm fat of ordinary appearance. Its surface is smooth; and, except at a narrow base of attachment, is entirely covered by the integument, so that it must have been nearly pendulous. The skin over the most exposed part of the tumour appears to have ulcerated, and partially healed again.

From the Museum of John Taunton, Esq.

190. A tumour removed from the front of the neck, on which it occupied the whole space between the chin and the sternum. It is nearly spheroidal in shape, measuring nine inches in diameter, and six inches in depth. It is composed throughout of large deep lobes of healthy-looking fat, united by delicate layers of fibro-cellular tissue; and its anterior third is covered by skin which was removed with it.

The patient was a man forty years old. The tumour, twenty-two years before its removal, commenced with what appeared to be a simple enlargement of the fold of integument under the chin, and gradually increased. Its lobes extended deeply among the muscles of the neck, and some were slightly attached to the œsophagus and trachea. The patient recovered after the operation.

From the Museum of Robert Liston, Esq.

191. Section of a fatty tumour, and of the skin by which it is thinly covered. It formed a pendulous broad-based tumour on the groin. The fat is of the natural texture of human fat, and divided by thin fibro-cellular partitions.

Hunterian.

192. A small tripartite and lobulated fatty tumour, covered by skin, and attached by a narrow pedicle to the skin of the axilla, from which it was removed. *Hunterian.*

193. A small pendulous tumour, probably of the same kind as the last described, from the skin of the abdomen. *Hunterian.*

194. A fatty tumour which was attached by a long narrow pedicle to the exterior of the intestine of an ox. The tumour is composed of two chief parts united by a narrow isthmus, and each of an elongated oval form. It is about six inches in length, and at its widest part is two inches in diameter. The fat of which it is composed is firm, like beef-suet, and not lobulated. *Hunterian.*

195. A thin fibro-cellular capsule, in which the tumour last described was enclosed, together with the pedicle by which it was attached. *Hunterian.*

196. A specimen of the Lipoma arborescens of Müller. It is a section of the condyle of a femur, around the articular margin of which there is a crowd of small, oval, and branched growths of fat, each covered by a shining membrane, like a reflection of synovial membrane, and all attached by long and slender pedicles. Their shapes and sizes are various: some are like branching threads; others are nearly cylindrical; others flattened and lanceolate. The articular cartilage has been removed from the front of the condyle, and the exposed bone is hard and polished, with an appearance of gouty deposit on it; elsewhere the cartilage is thin. *Presented by Sir William Blizard.*

Specimens of fatty tumours in other parts of the collection:—
In the tongue, 1065.
,, heart, 1529.
,, spermatic cord, 2461.

Other specimens of the Lipoma arborescens are placed among the diseases of the joints.

2. *Cartilaginous and Osseous Tumours.*

[Enchondroma, of Müller; Sarcoma cartilagineum; Sarcoma chondroides; including, when seated in or upon bones, the Osteo-chondroma; Osseous Exostosis; Ivory Exostosis.]

The cartilaginous tumours resemble, in both structure and chemical composition, the cartilage of the fœtal skeleton, to which also they in many instances display a further resemblance in their tendency to ossification. The bone in an ossified cartilaginous tumour is either dense, hard, and tough, like the wall of one of the long bones of the skeleton, or it consists of cancellous tissue which contains marrow, and which, when the ossification of the tumour is complete, is invested by a thin layer or outer wall of compact bone.

Those tumours alone which are formed by ossification of cartilaginous tumours, or of which the tissue resembles, as stated above, that of the natural bones of the skeleton, are here arranged as examples of "osseous tumours," and as belonging to the same species with the cartilaginous, of which they are indeed only a further development. Other tumours formed, either wholly or in part, of bone, such as the osteoid, and some examples of medullary cancers which have a kind of bony skeleton, are arranged under other specific names; for they essentially differ from these true osseous tumours in that, among other differences, the bone which forms or is contained in them is neither hard and resisting like the compact tissue, nor cancellous and full of marrow like the cancellous tissue, of the bones of the skeleton.

The following specimens, from 197 to 207 A, are arranged to illustrate, 1st, the general characters of cartilaginous tumours; 2nd, the characters of the osseous tumours developed from them; 3rd, the softening to which, as to a degeneration opposed to their development into bone, the cartilaginous tumours are liable; and, 4th, the combination of cartilaginous with medullary tumours.

The first three of these chief points are further illustrated by the numerous specimens of cartilaginous and osseous tumours of bones which are arranged in the series of the diseases of Bones [No. 772 to 796, and No. 3214 to 3220], on the same plan as the specimens in the following section, and which, together with these, display the following general facts:—1. That cartilaginous tumours may be divided into two forms or varieties, according as the tumour is either composed of numerous masses, lobes, or nodules, severally invested and united together by fibro-cellular tissues, as in 197-8-9, 207, and others, or consists of a single mass imperfectly or not at all partitioned, as in 201, 207 A, 772, and others. 2. That the ossification of a cartilaginous tumour may commence either by the outgrowth of bone from the surface of any bone on which it is seated, as in 776, 779, or at various points in its substance, as at so many centres of ossification, as in 207. In the former case, the base and deeper part of the tumour will be osseous; but, till the process of ossification is complete, its surface will be formed by a layer of cartilage. In the latter, the ossification may proceed uniformly through the whole mass, or collection of masses. 3. That osseous tumours may be divided into two varieties, according as the bone is either compact and hard, as in 793-4-5, 3215-16; or cancellous, containing marrow, as in 203, 782-3-4-5, 3220. 4. That the structure of an osseous tumour is in general like that of the bone on or in which it is formed: those on the skull, for example, being usually very hard, and, if not solid, having an interior tissue like that of diploe; while those in or about the heads of the long bones and the phalanges are usually cancellous, with an external layer either of cartilage or of compact bone.*

197. A section of a tumour which weighed 144 ounces, and was removed by Mr. Hunter from the side of a man's neck. It is of an irregular oval form, measuring nine inches in one, and seven inches in another, of its chief diameters. It is deeply lobed, and very firm; its outer surface is uneven and nodulated; its cut surface displays numerous round masses of pale, semi-transparent, and glistening cartilage, connected by their several investments or capsules of fibro-cellular tissue. These masses are of various size, from a quarter of an inch to two inches in diameter. A few of the largest are also traversed by thinner partitions of fibro-cellular tissue, and some of them are very soft. *Hunterian.*

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[*] There appears to be a further analogy between the osseous tumours and the bones on which they grow, in their mode of development. The formation of an osseous tumour in or upon any of the bones of the trunk or extremities is preceded by the formation of a mass of preparatory cartilage which serves as a basis for the ossification, just as the fœtal cartilaginous skeleton serves as a basis or model for the osseous one; but, as in the development of any of the bones of the vault of the skull, its preparatory cartilage is not all formed at one time, but its formation only just precedes, and is commensurate with, the ossification, so the osseous tumours which form on these bones are not preceded by masses of cartilage, but as fast as their cartilage is formed it ossifies.

198 Another section of the same tumour. *Hunterian.*

199. Another section of the same tumour.

The case is thus recorded by Mr. Hunter:—

"*Tumour extracted from the Neck, weighing* 144 *Ounces.*

"John Burley, a rigger, thirty-seven years of age, of a middle size, dark complexion, and healthy constitution. About sixteen years ago fell down and bruised his cheek on the left side above the parotid gland. It was attended with a good deal of pain, which in four or five weeks went off, and the part began to swell gradually and continued increasing for four or five years, attended but with little pain.

"At this time it was increased to the size of a common head, attended with no other inconvenience than its size and weight. He again fell and received a wound on its side, which gave considerable pain at first, but it got well in eight or nine weeks. After this the tumour increased without pain, on the lower part, as also at the basis, extending itself under the chin to the amazing size it now appears. Lately he has perceived that its increase is much greater than what it was some time ago; he says he can perceive it bigger every month.

"The tumor is in parts the color of the skin; in other parts of a shining purple where the skin of the cheek is elongated. The beard grows upon it, and is shaved in common. When by accident it is wounded, it heals kindly, because it is only the skin that is wounded, and has sensation in common with the skin. It is hard to the feel in some places, and in others softer, as if containing a fluid. It seems quite loose, and unconnected with the scull or lower jaw; and can be moved easily without giving pain.

"The tumor weighed 144 ounces.

"The operation was performed on Monday, October the 24th, 1785; it lasted twenty-five minutes, and the man did not cry out during the whole of the operation.

"His symptoms after the operation were mild and gentle. Does this gentleness arise from the want of sensibility, for the man who had the tumor taken out of the calf of the leg had his symptoms run high, and then soon sunk; and he seemed to feel the operation as if tortured."—*Hunterian MS.: Cases and Observations*, No. 48.

200. Portion of a nodulated cartilaginous tumour, seven inches in diameter, which formed on a man's ribs. The numerous nodules of which it is composed are of small size, and very closely packed together. Most of them have the aspect of fœtal cartilage, though whiter and less transparent. Much of the central portion of the tumour has an opaque, light ochre-

yellow colour, and is less consistent than true cartilage. A few points of bone also are scattered through its substance.

Presented by Sir Everard Home.

This specimen is referred to by Professor Müller[a] as an example of the tumour which he has named Enchondroma.

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[a] Ueber den Bau . . . . der Geschwülste, p. 48.

201. A slice cut transversely from the lower part of a great tumour of the lower jaw which is preserved among tumours of the jaws, No. 1034. It is composed of compact and nearly homogeneous, opaque, milk-white cartilage. On its outer surface it is slightly nodulated; within it are several small isolated formations of cancellous bone, and numerous little cavities with irregular broken walls.

The patient was thirty-nine years old, and the tumour had been growing eight years. The rest of the history is with the description of No. 1034.

From the Museum of Joshua Brookes, Esq.

202. Sections of a tumour removed from a man's cheek, probably from the neighbourhood of the parotid gland, for there are portions of whisker-hairs on part of the integument removed with it. It is of an oval form, two and a half inches in its chief diameter, with large round nodules on its surface. It is composed of many round masses, united and severally invested by thin layers of fibro-cellular tissue. Some of these masses are formed of compact, blueish-white, semi-transparent, glistening cartilage, like that of the fœtal skeleton: in others, the same kind of cartilage has irregularly ossified. The whole tumour is invested by a thin capsule of fibro-cellular tissue. *Presented by Sir William Blizard.*

203. A wrist, with a small oval tumour formed of soft cancellous osseous tissue, with marrow in the cancellous spaces. The tumour is situated over the dorsal surface of the *scaphoid* and *trapezial* bones. It is completely invested by a thin fibro-cellular capsule, and is loosely connected with the adjacent parts. *From the Museum of Sir A. P. Cooper.*

204. A tumour removed from the cheek, where it was situated superficially, and immediately anterior to the ear. It has been dried. In its original state it is described as "a dense lobulated tumour, of the size of a hen's egg, and flattened oval form, composed of calcareous particles of an acicular form, loosely aggregated in a gelatinous-looking matter." A delicate vascular membrane invested it and separated its lobules.

The patient, a lad aged fifteen, recovered after the removal of the tumour.

From the Museum of Robert Liston, Esq.

205. Sections of an irregularly oval tumour, removed from the neighbourhood of the parotid gland of a lad eighteen years old. A part of it has the same cartilaginous structure as some of the preceding specimens; but the greater part is softened, resembling a transparent jelly, or œdematous fibro-cellular tissue, with cavities in its interior.

Presented by Sir William Blizard.

206. Part of a large tumour which nearly filled a woman's pelvis. The uterus, vagina, and part of the rectum, are attached to its surface, but not involved in the disease. That which remains of the morbid substance is probably only a part of the exterior of a large round tumour, from which the centre and the rest of the exterior were discharged by softening and ulceration. It consists of nodules of transparent cartilage, loosely held together, and covered by a thin membrane. It is throughout softer than fœtal cartilage, and its interior is not firmer than weak gelatine. Some portions of it are almost fluid; and near the surface there are a few small deposits of soft bone.

The patient was a woman thirty-four years old. She had several children, and each labour was more difficult than the previous one. The last labour, thirteen months before her death, was very severe and protracted. After it, the pain which she had suffered during the pregnancy, and which had been increased by a fall, was augmented; and a large, hard, immoveable tumour was felt in the left side of the pelvis, almost filling the cavity, and pressing on all the contained organs. It grew rapidly; and large quantities of purulent matter were discharged from the vagina, into which the tumour had ulcerated at some part not shown in the preparation.

After death the tumour was found closely connected with the sacro-iliac symphysis and the adjacent bones, which appeared ulcerated. It projected also at the back of the pelvis.

From the Museum of John Taunton, Esq.

207. Section of a tumour, thirteen pounds in weight, which grew in front of the lumbar vertebræ of a soldier thirty-seven years old. It was loosely connected with the vertebræ by its investing fibro-cellular tissue. It surrounded the aorta, and the inferior *cava* and iliac veins; the veins were compressed and filled by coagula. It was of an oval form, lobulated, sixteen inches long, and about six inches wide. Half the tumour was composed of a soft, pulpy and flocculent, medullary substance, of a brownish colour. A small portion of this is preserved, and hangs in long and loose shreds. The other half of the tumour, including the greater part of that which is preserved, consisted of nodules of cartilage of various forms—rounded, oval, elongated, or quite irregular—and from one-fourth to three-fourths of an inch in diameter. These are invested and held together by layers of fibro-cellular tissue. They have both the obvious and the microscopic characters of fœtal cartilage. In the centres of some of the nodules of cartilage there are small portions of cancellous bone, like the points of ossification of the fœtal skeleton; the centres of others are rather softened. The limit between the cartilaginous and the medullary part of the tumour is well marked; and although they are in close contact, there is no appearance of any conditions intermediate between them, as if the one had degenerated into the other.

In a portion of the tumour, not shown in this specimen, the softening process had reduced many of the nodules of the cartilage into a yellow viscid fluid, which was retained, as in thick-walled cysts, in the fibro-cellular investments of the softened nodules, and was in some instances mixed with blood.

Presented by James Johnson, Esq.

207 A. Section of an oval tumour, about three inches long, removed from the surface of the parotid gland. The upper half of the tumour consists of cartilage arranged in nodules imperfectly partitioned from each other. The lower half of the tumour is composed of a soft, filamentous, shreddy

substance, which had a pale pinkish hue, and the general aspect of a medullary tumour. There is no distinct line of boundary between the two substances: they are mingled at their contiguous borders, so as to form one mass enveloped by a single fibro-cellular capsule.

The patient was an apparently healthy woman, thirty years old. The tumour had been growing for many years, with little pain. It was loosely connected with the adjacent parts.

Presented by E. A. Lloyd, Esq.

Specimens of Cartilaginous and Osseous Tumours in other parts of the Museum:—
- In, or upon, bones, 772 to 796, and 3214 to 3220.
- On the lower jaw, 1034 to 1039.
- In the ethmoidal and sphenoidal cells, 2199.
- In tumours of the testicle, 2384-5-6-6 A.

Nos. 573-4-5, 797 to 800, and 3221 to 3235, exhibit osseous growths bearing some resemblance to the specimens of this kind of tumour, though probably of essentially different nature.

3. *Fibro-Cellular Tumours.*

[Cellular Tumour, of Lawrence;* including, probably, the Common Vascular Sarcoma, and the Pancreatic Sarcoma, of Abernethy;† and most examples of the Chronic Mammary Tumour, of Sir A. P. Cooper.‡]

Two stages of development may be observed in the tumours of the fibro-cellular species. In their completely developed state they consist, as their name implies, of a tissue similar to the fibro-cellular, areolar, or common cellular, tissue of the healthy parts. This tissue is formed, by the close weaving of its filaments without any apparent order, into masses of an elastic, compressible, compact, opaque white substance, which, in different examples, presents a more or less obscurely fibrous aspect, and various degrees of toughness or hardness.

In an earlier stage of development these tumours are comparatively soft or brittle, and consist of a pale greyish or yellowish succulent substance, which glistens on its cut surface, has a vitreous aspect, and is partitioned or intersected by opaque-white, circling, and undulating bundles of fibro-cellular tissue. The progress of development appears to consist in the gradual production of the fibro-cellular tissue in the place and to the exclusion of the more succulent substance; and as one or other of the substances predominates, so may the appearance of each specimen of the tumour be different.

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* 'Observations on Tumours,' by William Lawrence; in the 'Medico-Chirurgical Transactions,' vol. xvii. p. 10. London, 1832.

† 'An Attempt to form a Classification of Tumours;' in his 'Surgical Observations,' vol. ii. London, 1815.

‡ 'Illustrations of the Diseases of the Breast,' Part I. p. 51. London, 1829.

It is to be observed that, in these as in other tumours, there is no evidence that the full development of their structure is attained, as that of the natural parts of the body is, at a certain age or period of their existence. On the contrary, these, like the cartilaginous and other tumours, may exist long, and grow to a large size, with an incompletely developed structure; or they may attain their complete development while of small size and short duration.

The apparent relation between these tumours and the solid growths formed in cysts, and constituting the sero-cystic tumours, has been already mentioned; and the formation of cysts within solid tumours, to which allusion has also been made, is displayed in the first and last two specimens of the section; of which two, No. 215 may be regarded as an example of the cysto-sarcoma simplex, and No. 216 as one of the cysto-sarcoma phyllodes of Professor Müller.

207 B. Sections of a tumour which was imbedded in a mammary gland. The tumour is of round-oval form, smooth on its surface, and measures about four inches in its chief diameter. It is invested by a thin, fibro-cellular capsule, which was closely connected with the skin and the substance of the mammary gland, but loosely with the surface of the tumour. The tumour is composed of a uniform yellowish white, soft and compressible, but tough and elastic, substance. Its cut surfaces present marks of a lobular arrangement and of a fibrous texture, as if fibro-cellular tissue were woven in curves and circles within a homogeneous, glistening, succulent, vitreous substance. In one part, which was the most deeply situated, it is more fibrous than elsewhere, and has the aspect of a mass of fibro-cellular tissue infiltrated with serum. A few small oval cells or cysts, scattered through the substance of the tumour, were filled with a fluid like synovia. In the recent state a similar fluid could be pressed from the substance of the more succulent parts of the tumour.

The patient was an otherwise healthy woman, twenty-seven years old. The tumour had existed fourteen years, and had scarcely increased from the time when it was first observed to within six months of its removal. Then, it began to enlarge rapidly; but still, as in all its course, gave no pain. The patient quickly recovered after the removal of the tumour.

The mammary gland surrounded the tumour, and appeared healthy.

Presented by William Lawrence, Esq.

208. A breast with a large tumour. The tumour is of an oval form, and measures nearly twelve inches in length: it weighed seven pounds. It is of a white colour, of dense, obscurely fibrous, and compact texture. It is composed of several mutually flattened lobes, united by thin loose layers of fibro-cellular tissue. It was very little vascular, and appeared to be entirely composed of filaments of fibro-cellular tissue, very closely and intricately woven together. It was loosely connected with all the surrounding parts. The mammary gland was healthy, and lay compressed beneath the tumour.

The patient was a middle-aged woman. The tumour had been twelve years in progress without pain, and was inconvenient only by its size and weight. The patient used to sit with it resting on her knee, till a portion of the integuments began to slough in consequence of the pressure. She recovered after the operation.

Presented by Edward Stanley, Esq.

209. Sections of an oval tumour, like that last described, but smaller and firmer. It is two inches in its chief diameter, and is composed of several portions of various size and form, but generally rounded except where they are mutually compressed. The outermost of these project in knobs upon the surface of the tumour; and all are separated by delicate layers of fibro-cellular tissue connected with the thin capsule investing the whole. All the portions of the tumour are alike composed of a nearly white, compact, firm, and elastic tissue, with a homogeneous basis traversed by variously arranged white and glistening fibres.

Presented by Sir William Blizard.

210. Portion of a large tumour, removed from the thigh: it was supposed to be an aneurism. In its whiteness, its lobed arrangement, and its obscurely fibrous character, it much resembles that last described; and

at the same time, in the smallness and leaf-like form of many of its lobules, it has some likeness to the solid and compact growths within the sero-cystic tumours. [See Nos. 173-4-6-7.] *Hunterian.*

211. A tumour from a breast. It is of irregular form, flattened, with a nearly oval outline, opaque white, very firm and elastic, obscurely fibrous, and composed of many lobules, which are held together and generally invested by fibro-cellular tissue. *From the Museum of Sir A. P. Cooper.*

212. A thin section of a breast, and of a tumour, dried after the minute injection of the blood-vessels. The tumour resembles that last described, but is less lobulated. It appears, also, much less vascular than the surrounding tissue. *From the Museum of Sir A. P. Cooper.*

213. "A tumour of the cellular membrane" (*Hunterian MS. Catalogue*). It has an oval form, and is an inch and a half in diameter; its surface is nearly smooth; it is composed of a firm, nearly white, substance, with short fibres undulating through it, in the form of net-works and incomplete partitions. A portion of skin is attached to its surface. *Hunterian.*

214. A tumour removed from the surface of a parotid gland. It is round, slightly knobbed on its surface, invested by a thin fibro-cellular capsule, and about an inch and a half in diameter. It is composed of a pale, yellowish white, firm, elastic substance, nearly uniform, and with no distinct appearance of a fibrous structure.
From the Museum of Sir A. P. Cooper.

215. Sections of a tumour removed from below the jaw of a young woman. It is of an irregularly oval form, with an uneven knobbed surface, and measures nearly two inches in its chief diameter. It is pale, compact, and firm, obscurely fibrous, and with several minute, smooth-walled cysts scattered in it. It is invested by a thin fibro-cellular capsule. *Hunterian.*

216. A breast, with a tumour twelve pounds in weight, and measuring eight inches in depth, and ten inches from side to side. The surface of the

tumour, which rested on the pectoral muscle, is deeply lobulated; and the section of one side of it shows that at this part also, and probably throughout its substance, the tumour is composed of many distinct portions, which are round and oval, and of various size. These are closely united by layers of fibro-cellular tissue, the cut edges of which have the appearance of wavy fibres traversing all parts of the tumour, and partitioning it into lobules. The substance which forms the basis of these lobules is nearly similar in all of them; it is moderately firm, pale, compact, nearly uniform, but in a few parts obscurely fibrous or striated, as if by opaque white fibres undulating through a more transparent medium. In the softer and less fibrous parts of this substance there are numerous round and oval cysts, from a line to half an inch in diameter, with distinct membranous walls and polished internal surfaces. Some of these contained fluid; others a curdy substance; others a semi-fluid jelly-like substance, which is still oozing from them; and some are partly filled by soft growths which have sprung from the inner surface of their walls, like those in the sero-cystic tumours. Two of these are shown at the deepest part of the section. There is a large sloughing ulcer of the integuments below the nipple, produced by the pressure of the tumour, which the patient was in the habit of supporting on her knee.

The tumour was removed from a woman forty-four years old, and she recovered.

From the Museum of Robert Liston, Esq.

Specimens of fibro-cellular tumours in other parts of the Museum:—

On the tongue, 1066.
In the labium, 2715.
In the breast, 2772 to 2783.

Growths of fibro-cellular tissue, bearing some analogy to the tumours of this species, though essentially differing from them in that they are not separable from the adjacent parts as tumours, or distinct new growths, occur in or upon the skin. Specimens of such growths, or hypertrophies of skin, as they have been called, are shown

On the nose, 2284, 2285.
,, scrotum, 2466, 2467.
,, prepuce, 2283, 2466, 2467.
,, labia, 2278, 2279, 2714.
,, nymphæ and prepuce of the clitoris, 2708 to 2714.

And as the parts last named in the foregoing list consist of a tissue which connects that of the skin with that of mucous membrane, being intermediate between the two, so are the growths on them intermediate in character between those on the skin and the mucous or gelatinous polypi of the mucous membranes, such as are shown

In the urinary bladder, 1999, 2000, 2001.
,, nose, 2199 to 2209.
,, external meatus of the ear, 2212, 2213.
,, urethra, 2578.
,, uterus, 2660 to 2663.

4. *Fibrous and Fibro-Calcareous Tumours.*

[Tendinous, Desmoid, Fibroid, and Chondroid Tumour; including the Hard Fleshy Tubercle of the Uterus, of Baillie;* the Corps fibreux de la Matrice, of Bayle;† comprising also, as a variety, the *Fibro-cystic Tumour*, which includes many specimens of the Cysto-sarcomatous growths, of Müller, and most of the specimens of the Hydatid or Encysted Disease of the Testicle, of Sir A. P. Cooper.‡]

That which, from its frequent occurrence and the uniformity of its character, may be taken as the type of this species, is the fibrous tumour, or fleshy tubercle, of the uterus, with the specimens of which, from No. 2664 to No. 2695, those in the following section should be studied for the complete illustration of the species.

The fibrous tumour, like the preceding, derives its name from the tissue to which, among all the natural structures, its own bears the most resemblance; but, as among the natural parts of the body, it is not possible to draw a definite line of distinction between the fibro-cellular or areolar, and the fibrous or tendinous, tissues, because there are examples presenting every shade of difference between the extremes of both, so the fibro-cellular and the fibrous tumours may be said to *run into* one another. Specimens may be found which might be referred to either species; and as the fibro-cellular and fibrous tissues resemble each other in their minute structural and chemical composition, and differ chiefly in their general aspect and mechanical properties, so do these two species of tumours.

Two varieties, it has been mentioned, may be observed among the cartilaginous tumours, in one of which the tumour is composed of several portions united by fibro-cellular tissue, while in the other the whole tumour is a single mass.

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* 'The Morbid Anatomy . . . of the Human Body.' London. 8vo. 1818; p. 383.

† 'Dictionaire des Sciences Médicales, t. vii. p. 69. Paris, 1813.

‡ 'Observations on the Structure and Diseases of the Testis.' London. 4to. 1830. part ii. p. 79.

Similar varieties exist among both the fibro-cellular and the fibrous tumours. Some of these are in one mass; some consist of many portions united by fibro-cellular tissue, and easily separable; and in some the component portions are intimately united, and their separation is indicated only by the direction of the fibres severally belonging to them, which fibres, on the surface of a section of the whole tumour, are seen arranged nearly in concentric circles round many points, as round so many centres or nuclei.

In the following section the intention of the arrangement is to show, first, the general characters of the fibrous tumours, and some peculiarities in their modes of growth; secondly, the characters of fibrous tumours containing cysts, or, as they may be termed, fibro-cystic tumours; thirdly, to present examples of the malignant character sometimes manifested by tumours which apparently resemble, in every other respect, the fibrous tumours of the uterus; and, fourthly, to illustrate two processes of what may be probably regarded as degenerations to which the fibrous tumours are liable. The first is the process of *calcification* by the deposit of earthy matter, consisting chiefly of phosphate and carbonate of lime, in a shell around the tumour, or in a coral-like skeleton within it; in which state these tumours have received the name of *fibro-calcareous*. The second is the process of *softening*, in which one or more portions of the tumour, with their texture loosened, become infiltrated with fluid, or are removed, leaving cavities full of fluid in their places.

Some of these particulars are more largely illustrated by the specimens of fibrous tumours of the uterus, among which also are examples of the sloughing and some other morbid changes to which these tumours are liable. The characters of the fibro-cystic tumours are more fully shown among the diseases of the testicle [No. 2387 to 2392].

217. Vertical section of an uterus and of a fibrous tumour imbedded in its walls. The tumour is situated in the fundus of the uterus, just beneath the mucous membrane, which is protruded before it into the cavity. It is spherical in form, and nearly an inch in diameter; its texture is very dense and firm; it has a greyish and homogeneous basis, variously traversed and intersected by bundles of tough white fibres. The surface of the tumour appears loosely connected with the adjacent textures.

Presented by William Lawrence, Esq.

218. A tumour which was attached to the capsule of the hip-joint. It has a regularly oval outline, is rather flattened, has a nearly smooth surface,

and measures about three inches in its chief diameter. In structure it very closely resembles the preceding specimen; consisting of a firm, tough and compact, greyish basis, traversed in various directions by curving and interweaving bundles of opaque white fibres.

The patient, the Right Hon. William Windham, was sixty years old, and had long suffered from rheumatic complaints. About ten months before his death he fell and hurt his hip; and to the injury then received he ascribed the origin of this tumour. He died sixteen days after its removal.

Presented by William Lynn, Esq.

219. Part of a foot, with a section of a tumour of which the base is fixed deeply in the tissues over the whole length of the metatarsus, and projects, with an uneven knobbed surface, on the back of the foot. The texture of the tumour is pale, very firm, tough, and elastic. It is traversed by interlacing, undulating, opaque white, coarse bundles of fibres, which chiefly pass from the base towards the surface of the tumour, but do not divide it into lobes. The substance of the tumour has been made yellow by the action of the spirit. The skin over it is ulcerated; the other adjacent tissues appear healthy. *Presented by Sir Everard Home.*

220. A tumour resembling that last described, but much larger, and having the characters of the fibrous tumour more strongly marked. It forms an oval mass, which measures nearly six inches in its chief diameter. It is fixed to the periosteum on the inferior surface of the bones of the tarsus, and to all the deepest tissues of the sole of the foot; but the boundary between it and them is distinct, and a thin layer of fibro-cellular tissue surrounds it. The base of the tumour extends from the os calcis to the phalanges of the toes, and its surface projects two or three inches beyond the plane of the sole. The skin over it is healthy, and, with some of the plantar fascia, is reflected from its surface. The blood-vessels have been injected, but none of the injection appears to have entered the tumour.

The patient was a nobleman, thirty-five years old when his leg was amputated. An enlargement of the sole had been noticed when he was only five years old. Mr. Hunter, Mr. Pott, and many others saw it; and many attempts were unsuccessfully made to reduce the swelling. The tumour increased gradually, but did not produce pain till shortly before it was removed. The patient recovered from the operation.

The other half of the foot and tumour is in the Museum of St. Bartholomew's Hospital.

From the Museum of George Langstaff, Esq.

221. An uterus, with a great number of fibrous tumours in its walls. They vary from half an inch to four inches in diameter; and some of the smaller are placed so close together that they are mutually flattened, and appear to form one tumour. The largest tumours are situated at the fundus, and in the anterior wall, of the uterus; and all which project from the uterus do so towards the abdominal cavity. One of the largest, being cut open, is seen to be composed of many small portions closely united, and each presenting the usual appearance of fibres traversing an uniform and very firm basis.

222. Section of a tumour removed, with the integuments and *platysma myoides* muscle which covered it, from the front of a man's neck. The whole tumour weighed upwards of twelve pounds. It is of a regular oval form, measures in its chief diameter nearly nine inches, and is invested by fibro-cellular tissue. The section of its interior is of a dirty yellowish white colour, in parts slightly shining, and variously shaded and spotted with grey. Its texture is very firm and tough. In some parts it is traversed by curving fibres, which give it the appearance of being lobed; in some, there are minute cells, which were filled with a turbid fluid; in some parts, also, there are deposits of earthy matter; and in some it appears softened.

The patient was fifty-two years old, and recovered rapidly after the operation. The tumour had been fifteen years in progress.

From the Museum of Robert Liston, Esq.

222 A. Section of a flattened oval fibrous tumour, removed from beneath the integuments of a woman's back. Its base was closely connected with the trapezius muscle, a portion of which was removed with it. The tumour is composed of four portions of unequal size, which are loosely connected

by fibro-cellular tissue; and on the cut surface of each portion there is an appearance of lobular arrangement. In texture, the whole of the tumour exactly resembles the preceding specimens from 217 to 221. In the portion of integument lying over the tumour is a large cicatrix—the mark of an operation by which a tumour had been previously removed from the same part.

The patient was an apparently healthy woman, between fifty and sixty years old. Nine months before the removal of this tumour, one which had been growing for about sixteen months was removed from the same part. This was growing rapidly, and with much pain; the skin over it was very red, and the adjacent veins were large. There was profuse hæmorrhage at the time of the operation; but the patient recovered from it, and seemed restored to health. Examined with the microscope, the tumour appeared to consist of well-formed fibrous tissue, and it yielded a large quantity of gelatine when boiled in water.

Presented by William Lawrence, Esq.

223. Section of a breast, and of a tumour imbedded in the mammary gland. The tumour is nearly spherical in shape, and between three and four inches in diameter. Its texture is very firm and resisting. It is composed of a pale greyish uniform basis, traversed by shining white fibrous bundles, which extend in various directions through its substance. In its general aspect it resembles the common specimens of the fibrous tumour of the uterus. The mammary gland, pushed aside and spread over a part of the tumour, is slightly adherent to it, but appears healthy in its texture. *Presented by James Paget, Esq.*

224. A portion of one of the lungs of the woman from whom the breast last described was removed. Several small masses, of a uniformly white, hard, and homogeneous substance, like hard cancerous tumours, are imbedded in the healthy pulmonary tissue. They lie chiefly beneath the pleura, and their exposed surfaces are smooth and flat.

The patient was a woman forty-seven years old, disabled by rheumatic disease of the joints, and generally unhealthy. The tumour was first perceived four months after the cessation of menstruation, and grew slowly and without pain till it was accidentally struck. Both it and the whole breast then became painful, and the tumour enlarged more quickly than before. The tumour was removed, together with the whole mammary gland, and a large portion of the integuments, about five months from its first appearance. The wound quickly healed; but, three months after the operation, a tumour appeared beneath the cicatrix, and grew rapidly and with great pain. Three months after its first appearance, when it had attained about the same size as the tumour which had been removed, this second tumour was completely and spontaneously separated by sloughing from the surrounding parts, and was removed entire through a large sloughing aperture in the integuments. The aperture enlarged, and the surface from which the tumour had separated assumed the appearance of a huge cancerous cavity, with knotted sloughing walls, and very hard everted edges. The patient sank under the extension of this disease and the constant discharge from the ulcerated surface. She died seven months after the removal of the first tumour. After death, all the internal organs were found healthy except the lungs, in which there were numerous growths, such as are shown in No. 224, and the stomach, in the mucous membrane of which were many small hæmorrhagic ulcers.

The other half of the breast, and the tumour which sloughed out (and which presented the same general characters as that to which it succeeded), are preserved in the Museum of St. Bartholomew's Hospital.

Presented by James Paget, Esq.

225. Section of a large tumour which was taken from the abdominal cavity of an old woman, in whom, probably, it had grown in or upon the walls of the uterus, and had been gradually detached from them. The tumour is kidney-shaped, seven inches in length, and three inches and a half in width. It is composed of a hard yellow earthy substance, deposited irregularly in the substance of a tough fibrous tissue. Its external surface is minutely nodulated and rough. It is invested by a thin shining fibro-cellular capsule, to which the adjacent abdominal organs were adherent.

Presented by John Howship, Esq.

The other section of the tumour, with parts of the adjacent organs, is preserved in No. 2677, to the description of which also the history of the case is added.

226. Sections of a large brownish coral-like mass, oval in form, about five inches in its chief diameter, and very compact and heavy, which was found in a grave-yard and sent to Mr. Hunter as a urinary calculus. It was probably formed within a fibrous tumour of the uterus. It yielded, on analysis, 18·644 per cent. of animal matter, consisting of gelatine with a small proportion of albumen. Its other chief constituents were found to be phosphate and carbonate of lime, the proportion of the carbonate being apparently greater than it is in human bone. *Hunterian.*

226 A. Section of a fibrous tumour which was connected with the round ligament of the uterus. It has the ordinary characters of tumours of this species; but a circumscribed portion of it, near its surface, is softened and shreddy, and was infiltrated with serous fluid.

The tumour was taken from a woman forty years old, who died with peritonitis after strangulated hernia. The whole tumour appeared more vascular than is usual.

Presented by Edward Stanley, Esq.

227. An uterus, in the fundus of which is a spherical fibrous tumour, five inches in diameter. The section of the tumour exhibits in its interior a smooth-walled cavity of irregular shape, which was probably formed in consequence of the softening of a portion of the substance of the tumour. The wall of the uterus has grown around the tumour, so that, although so much distended, it is from a quarter to half an inch in thickness, and has the same strong and laminated texture as the impregnated uterus presents. The body and cervix of the uterus are elongated and enlarged in consequence of the rising of the tumour out of the lower cavity of the pelvis, but their texture is healthy. *Hunterian.*

Specimens of Fibrous Tumours in other parts of the Museum:—

In or upon bones, 801 to 805.
In or upon the jaws, 1040 to 1051.
" pharynx, 1091.
" stomach, 1159.
" intestines, 1378.
" dura mater, 2133.
" nerves, 2186 to 2192.
" lobule of the ear, 2214.
" testicle, 2387 to 2391.
" prostate, 2497, 2498.
" uterus, 2664 to 2695.

Certain growths of fibrous tissue appear to bear the same kind of analogy to fibrous tumours which, as already mentioned (pp. 91 and 95), the growths of bone, and of skin and mucous membrane, respectively, bear to the osseous and the fibro-cellular tumours. Such are the examples of epulis, the growth of fibrous tissue on the gum as if by mere increase of its proper tissue [Nos. 1027 to 1032]; and in some cases of polypus of the uterus, the fibrous tissue cannot be isolated as a distinct tumour imbedded in the wall of the uterus.

5. *Osteoid Tumours.*

[Ossifying Fungous Growths or Osteoid Tumours, of Müller.*]

The following specimens of the osteoid tumour are placed here, not so much to illustrate the structure characteristic of the species, as to indicate the position which it may hold in an arrangement of tumours: for, it does not appear that any parts besides the bones are ever the primary seat of osteoid tumours; and the features which they derive from their connexion with bones are so characteristic, that it seemed desirable to place the chief specimens of osteoid tumours among the diseases of bone. They are comprised between Nos. 806 and 816; and between Nos. 3237 and 3247.

The specific structural characters of the osteoid tumours appear to be, that it is formed, in the first instance, of a very firm and tough fibrous substance, which in its further development is ossified. Those seated in bones show that this ossification commonly proceeds from the surface of the bone on which the tumour grows, and thence extends outwards to the surface of the tumour till the whole is ossified. The bone of osteoid tumours appears to be always without medulla; and according to the characters of the bone, two varieties of the tumour may be distinguished. In one, the bone is light, grey, loose-textured, fragile, and friable; and is formed in delicate fibres and lamellæ, groups of which arranged together give the surface of the mass a fibrous and fasciculate appearance. In the other variety, parts of the bone, especially that about the surface, may present a nearly similar fibrous appearance; but the central and principal portions of it are hard and compact, of a dull white chalky aspect, capable of being scraped or rubbed into fine powder, and altogether, both in these characters and in its external appearance, bearing a singular resemblance to pumice-stone. It is chiefly among the specimens of this second variety of osteoid tumours that the infiltration of the morbid substance in the tissue of a bone is shown.

228. The dried trachea and lungs of a man from whom a large osteoid tumour of the femur was removed, and whose case is recorded, with the description of the femur, in No. 809. At the roots of both lungs, and apparently formed in their substance, are large nodulated and rough masses of spongy, but hard and heavy, bone. *Hunterian.*

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* 'Archiv für Anatomie, Physiologie, und wissenschaftliche Medicin:' Berlin, 1843. No. 5.

Similar masses and plates of bone attached to the ribs of the same patient, are preserved in No. 3238.

The preparation is engraved in the 'Series of Engravings . . . to illustrate the Morbid Anatomy, . . . &c.,' by Matthew Baillie. London, 1812. 4to. Fasc. ii. Pl. vi. fig. 2.

No. 1789 is probably a specimen of similar disease.

229. Portions of the arch of the aorta and of the left auricle of the patient from whom the lungs just described were taken. On their outer surfaces are small masses of a similar osteoid substance, marked by bristles. The internal surface of the aorta is slightly tuberculated with deposits of fatty matter beneath it. *Hunterian.*

230. Part of the thoracic aorta of the same patient, with a similar osteoid growth of considerable size upon its cellular coat. *Hunterian.*

6. *Epithelial Tumours.*

[Including some forms of the Epitheliel and Epidermal Tumours, of Lebert.*]

The specific character of tumours of this species is, that they are chiefly composed of nucleated cells or scales, like those of such epithelium as covers the mucous membrane of the human fauces and pharynx, which cells are collected in masses or layers, or in wart-like growths, and are held together by tissue in which blood-vessels are distributed among them. The limits of the species, and the parts and circumstances in which it occurs, are not yet defined; but its characters are so peculiar that they warrant its distinction. Its most usual seats appear to be the lower lip, in which it constitutes one of the diseases regarded as cancer of the lip; and the front of the leg, after it has been long the seat of simple ulceration or of some other consequence of injury. It is probable also that some other growths regarded as cancers of the skin are of the same nature as the epithelial tumours.

The epithelial tumours, like those of the two preceding species, are allied to the innocent tumours in the resemblance which their elementary structures bear to those of certain natural parts of the body; but they are allied to the malignant tumours in their tendency to spreading ulceration, and in the liability to disease which they appear to induce in the lymphatic glands receiving vessels from the parts in which they lie.

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* 'Physiologie Pathologique,' tom. ii. p. 5. Paris, 1845.

231. Part of a lower lip removed from a man at St. George's Hospital. A large portion of the border of the lip is covered by a slightly elevated warty growth, which is probably composed chiefly of cells like those of epithelium. The border of the growth is sinuous, rises suddenly from the surrounding parts, is smoothly rounded, and a little everted. Except at the border, all the exposed surface of the growth appears excoriated or unevenly ulcerated. *Hunterian.*

No. 248 is perhaps an example of the further progress of similar ulceration.

232. Section of a tibia, and of the adjacent parts. Almost the whole thickness of the shaft of the tibia, near its middle, is softened, broken into small fragments, and absorbed; the part thus diseased, about an inch in length, is occupied by a soft, pulpy, flocculent, and very vascular growth, which is almost entirely composed of nucleated scales like those of the epithelium of the pharynx. The growth protrudes through the integuments, in which it appeared to commence, with a granulated and fissured wart-like surface; and its posterior part, extending through the wall of the tibia, is imbedded in the deep muscles of the calf. The integuments through which the growth protrudes are thin, livid, and shining, like those around old ulcers of the legs; but they are not otherwise diseased, even at the margins of the growth, and the bone around appears healthy.

The patient was a sailor, who, thirty-three years before the amputation of his leg, was struck by a musket-ball on the front of the tibia. The ball was extracted half an hour afterwards, but necrosis of a portion of the anterior wall of the tibia ensued. After exfoliation of a thin long piece of bone, the wound healed, but imperfectly; and for thirty-two years it went on sometimes nearly healing and then again ulcerating. A year before the amputation, when the old wound was nearly healed, and the cicatrix was depressed, smooth, and tightly fixed to the tibia, there arose from the diseased parts a mass of vascular, warty, *fungous* granulations, which rapidly increased, giving considerable pain, and occasionally bleeding.

The patient died seven weeks after the amputation, with sloughing of the stump and pneumonia. No other tumours were found in any part of the body after death.

Presented by Edward Stanley, Esq.

7. *Scirrhous Tumours; Hard or Scirrhous Cancers.*

[Carcinomatous Sarcoma, of Abernethy; Scirrhoma, of Carswell;* Carcinoma simplex, and Carcinoma fibrosum, of Müller; Stone Cancer; Ivory Cancer.]

The common hard cancer of the female breast may be regarded as the type of the disease of which specimens are described in this section, from 233 to 251. The principal designs of the arrangement adopted are to illustrate, first, the general characters of scirrhous tumours or cancers of the breast, and of such others as, judging chiefly by their peculiar hardness, and their dense fibrous texture, appear to be most intimately allied to them; secondly, the process of softening in scirrhous cancer, and the process and characters of the subsequent ulceration; and, thirdly, the changes connected with what appears to be a partial healing of the ulceration.

233. Section of a hard cancerous tumour in a breast, and of a portion of skin to the inferior surface of which it is intimately adherent. The tumour is nodulated, and all the adjacent tissues are so closely united to its surface that there is no distinct line of limitation between them. The section shows that the tumour consists of a compact, very hard substance, which has a pale greyish-white, half transparent aspect, and is irregularly traversed by numerous shining white lines. These lines, representing short cords and bands imbedded in the tumour, are variously arranged: some are undulated; some decussate, and intersect each other in a very close, irregular, and confused network. At one part of the tumour also are a few minute, opaque, ochre-yellow dots. Its vessels have been injected, but it appears only slightly vascular.

From the Museum of Sir A. P. Cooper.

234. Section of a breast, in which there is a large and irregular mass of hard cancer, very like that last described, and towards the surface of which the nipple is deeply retracted. Near the nipple, and in the very substance of

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* 'Cyclopædia of Practical Medicine,' Art. *Scirrhus.* London, 1833.

the tumour, there are several well-defined oval cysts, from half a line to three lines in diameter; and one of these is nearly filled by a small globular growth from a part of its internal surface. There is a slight superficial ulceration around the retracted nipple.

From the Museum of Sir A. P. Cooper.

235. Section of a hard cancer of the breast, macerated and scraped to display the network of coarse fibrous tissue of which it is in part composed. It is probable that this tissue is a part of the original substance of the breast, and that the cancerous matter which was infiltrated or diffused in its meshes has been removed by the maceration and scraping.

From the Museum of Sir A. P. Cooper.

236. Sections of a hard cancer from a breast, dried after minute injection of its vessels. It appears very slightly vascular.

From the Museum of Sir A. P. Cooper.

237. Part of a breast, on the surface of which there is a thin, lens-shaped, hard, obscurely fibrous, and half-glistening tumour, resembling a hard cancer. It is imbedded in the substance of the skin, and is superficially excoriated. Its lower surface, exposed by dissection, is nodulated. Its external surface is smoothly convex.

From the Museum of Sir A. P. Cooper.

238. A cancerous breast, removed after death from a very old woman, in whom the disease had probably existed long and made slow progress. All the tissues of the breast are equally involved in the disease, which forms a large and rather flat tumour, projecting but little beyond the surrounding skin. Around the nipple, which is retracted to the centre of the tumour, the surface of the skin appears to have been excoriated. At one border of the tumour there is a small growth of a warty kind (like the common warty cancer of the skin), which appears to have protruded from its surface. The section of the tumour shows a pale, hard, and obscurely fibrous texture. *From the Museum of George Langstaff, Esq.*

239. The pyloric portion of a stomach, with the commencement of the duodenum. For several inches above the pylorus the coats of the stomach are half an inch thick. The thickened substance consists of two distinct layers. The external layer, occupying the place of the muscular coat, is formed by brownish grey, semi-transparent substance, traversed by white fibrous bands branching and forming networks, of which the chief lines pass perpendicularly to the surface of the stomach. The internal layer, occupying the place of the submucous coat, is formed of opaque white, dense, very tough, and obscurely filamentous tissue. The mucous membrane is closely adherent to this internal layer: its inner surface, deprived of its natural wrinkles, appears in parts swollen, in parts depressed or superficially ulcerated. The disease is limited to the stomach.

Hunterian.

240. Section of an ovary, in which all the natural texture has disappeared, and its place is occupied by a nodulated mass of uniformly hard, heavy, milk-white, compact, obscurely fibrous substance. The mass is of a round-oval form, and measures about an inch and a half in its principal diameter.

The patient was a woman forty-nine years old, eighteen years married, and the mother of eleven children. She had scirrhous cancer of the submucous tissue, and disease of the muscular coat, of the stomach, exactly similar to that shown in the preceding specimen. The other ovary, similarly diseased, is in No. 2636.

Presented by George Saunders, Esq.

241. A wart-like cancerous tumour, with a narrow base, removed from a woman's perinæum.

" *Cancer.*

" Mrs. Elliott, two years ago, had a small excrescence on the right side of the perinæum, close to the verge of the vagina. This was allowed to increase for two years before she applied for any relief, and then it was about the size of a common egg; but by this time it had contaminated the parts that had been continually in contact with it, which were the back end of the right labium, both externally and internally, with the inside of the left labium, and the angle uniting the two.

" The appearance of these parts was a surface that rose a little higher than the skin, a good deal like granulations, but in some places more warty. As these surfaces seemed evidently to have become diseased in consequence of being in contact with the others, it was imagined if the others were removed these might get well of their own accord, or at least with little trouble. Several escharotics were used, but to no purpose; and then it was thought advisable to extirpate this original tumour wholly by the root.

" This was done, and the wound healed as soon as such sized wounds do. While the wound was healing we watched the diseased surfaces above described, to see if they lessened; but very little alteration for the better could be observed. About two months after the operation a lymphatic gland in the right groin was found to be a little swelled, and a small chord or hard part was found to lead up from the right sore along the angle between the right labium and thigh. This was sometimes smaller than at other times; but at last at one part it inflamed, and became thicker and thicker, till at last it appeared of a duskish red on the skin. It increased gradually without the least pain, and then ulcerated on the surface, after which it still increased in breadth, and rose higher and higher above the skin like a mushroom.

" Whilst this was going on, the sore upon the lower part of the right labium began to rise higher, something like a nipple. This grew to the bigness of a large nut, and sloughs came off both these excrescences. A thread was tied round this last, which was tied tighter and tighter every day till it came entirely off, but another arose from the old base. Threads were tied round the necks of both, which were treated in the same manner as the first.

" While this was going on, a slight feverish complaint attacked the constitution. Every evening she was feverish, beginning with a shivering fit: some nights tolerably well, others worse. In the morning violent sweats came on, without any preceding cold or hot fit. The lower excrescence came off the second time; but the whole inner surface, instead of arising into a fungus as the other part had done, it inflamed and ulcerated, [as] also did [the] cicatrix of the tumour which we [had] extracted. A violent inflammation also came on the buttock, and the basis of the lower tumour also ulcerated.

" This ulceration continued till the whole diseased surface seemed to be gone, excepting the large excrescence; and after some time, when this inflammation was entirely gone off, all this ulcerated surface began to clean, to granulate, and heal. The left side healed entirely, and the right continued to heal fast. At the root of the great one upon the right labium there formed another, which ulcerated like the large one, and became indeed all one. Those in the groin began to swell considerably, forming a larger cluster. While this was going on her health was impairing: she became very weak—hardly able to sit up; had but little rest, therefore had recourse to opiates.

" However, with all her complaints, she had not in the least the appearance of a dying woman: spoke well; pulse not strong, but not very quick; ate tolerably, &c., when at once she was taken with a difficulty of breathing, and just twenty-six hours after the attack she died of it."—*Hunterian MS.: Cases in Surgery*, p. 127.

242. Section of a breast, in which there is an irregular knobbed mass of cancerous substance. The greater part of the cancer is hard, and presents characters similar to those of the preceding specimens; but a portion of it has softened into an ochre-yellow grumous substance; and some parts,

from which the softened substance has been removed, present an irregular network formed of coarse fibres, with intervening empty spaces.

From the Museum of Sir A. P. Cooper.

243. Section of a breast, and of a hard cancer in it. In consequence, apparently, of the softening of its substance in many distinct points, the cancer presents numerous small cavities, from half a line to two or three lines in diameter, the walls of which are in some smooth and nearly polished, in others rough, as if formed by softened and broken tissue. The whole of the cancerous substance has an opaque light yellowish hue.

From the Museum of Sir A. P. Cooper.

No. 2789 is the other section of the same parts.

244. Section of a breast, and of a hard cancer in it. The process of softening has proceeded so far that little of the cancerous substance remains, and in its place there is a large cavity, with irregular broken walls. Part of the cancerous substance forming, and immediately adjacent to, the walls of the cavity appears yellowish, grumous, and soft; and the injection of the blood-vessels of this part indicates that it was very vascular. The cavity does not appear to have opened externally, though close to the skin. The nipple is retracted, and adherent to the remaining portion of the cancer.

From the Museum of Sir A. P. Cooper.

245. A thin section of a breast, and of a hard cancer in it, dried after the minute injection of the blood-vessels. The substance of the tumour, part of which is said to have ulcerated, appears to have been highly vascular; and numerous vessels are shown tending towards it from the subjacent tissues. All the neighbouring textures also are more than naturally vascular. Two small masses of earthy matter are seen about half an inch from the tumour on each side of it.

From the Museum of Sir A. P. Cooper.

246. A thin section of some hard nodulated granulations from the surface of an extensively ulcerated cancer, dried after the minute injection of the blood-vessels. In a description of an engraving of this preparation, Sir Astley

Cooper states, "the arrangement of the vessels of these granulations resembled that of healthy granulations, but their diameters are less, and their radiation is not equally regular."

From the Museum of Sir A. P. Cooper.

247. A part of the integuments of a breast, with a small hard cancer beneath the nipple. Numerous circular and oval cancerous tumours and ulcers, from a third of an inch to an inch in diameter, are seated in the skin around the nipple. Of these, the tumours which are more distant from the nipple are entire, and have the appearance of round, hard, disk-like tubercles just elevated above the surface of the skin. Somewhat nearer to the nipple, similar tubercles and the skin over them are superficially ulcerated; and close round it are deeper and much larger ulcers. All the deeper ulcers have hard, elevated, everted, sinuous margins; and several of them have coalesced into broad irregular ulcers. The nipple itself is quite healthy, though its base is almost insulated by the ulceration.

The patient was an old woman. Many other parts of the body were cancerous.

From the Museum of George Langstaff, Esq.

248. The anterior part of a lower jaw, including the incisor and canine teeth, and the first bicuspid tooth on the right side, which, together with the lower lip and chin, was removed in consequence of ulceration following either an epithelial growth or a hard cancer of the lip. The ulcer is three inches and a half in width. It has destroyed all the border and middle portion of the lip, and the anterior part of the gum to the margins of the alveoli. It has a hard, knotted, rugged base, and thick, deeply sinuous, abruptly elevated, and everted margins. An enlarged and indurated lymphatic gland is attached to the jaw: it was situated below the chin, and was removed in the same operation.

The patient was an old man, who had several times had portions of the lip removed for what was considered to be a cancerous disease; but the affection always returned. These parts were therefore excised; but a fortnight after the operation violent erysipelas attacked the face and neck, and the patient died.

From the Museum of Robert Liston, Esq.

249. Part of a foot, on the back of which there is a large ulcer like that last described. The base and the middle of the ulcer are very vascular and shreddy; its borders and extreme margin are elevated, sinuous, and knotted, and at one part bounded by groups of warty growths.

From the Museum of Sir A. P. Cooper.

250. Part of a groin, in which there is a large and deep cancerous ulcer, with hard, thick, round, and granulated margins, which are elevated high above the surface of the adjacent skin, and everted far over it. *Hunterian.*

It is probable that this specimen was taken from the patient whose case is added to the description of No. 241.

251. The integuments of an axilla and of the adjacent part of the chest, in which (connected with cancer of the breast) there is a large, flat, cancerous growth, involving some of the axillary glands, the tissues about them, and the skin, and forming a pale, hard, and obscurely fibrous mass, very like that described in No. 238. The growth is but slightly elevated above the surrounding skin; its surface is smooth, and widely ulcerated in the middle; but the edges of the ulcer are turned inwards, and towards the base; and the base itself is smooth, and marked by radiating furrows, as if it were healing.

From the Museum of George Langstaff, Esq.

Specimens of Scirrhous Tumour or Hard Cancer in other parts of the Museum :—

In muscle, 345, 2792.
In bones, 817 to 821, 822-3?
In the tongue, 1068.
,, œsophagus, 1092.
,, stomach, 1160 to 1164.
,, liver, 1400.
,, pancreas, 1462 A.
,, lymphatic glands, 1471?
,, lungs, 1790-1.
,, pleura, 1761.
,, brain, 2068.
,, dura mater, 2138?-9?
,, penis, 2611-2-3?
,, ovary, 2635-6-7-9? 2701.
,, breast, 2784 to 2794.

8. *Medullary Tumours; Medullary or Soft Cancers.*

[Spongy or Ossivorous Tumour, of Ruysch and Palletta; Anomalous Tumour, of Monro *primus;* Pulpy Testicle, of Baillie; Struma fungosa (testis), of Callisen and others; Spongoid Inflammation and Tumour, of Burns; Fungus Hæmatodes, of Hey and Wardrop; Medullary Sarcoma, of Abernethy; Encephaloid, or Cerebriform Degeneration, or Cancer, of Laennec; Milt-like Tumour, of Monro *tertius;* Carcinoma spongiosum, of Young; Soft and Spongy Carcinoma, of Roux; Carcinus spongiosus, of Mason Good; Fungoid Disease, of Sir A. P. Cooper and Hodgkin; Medullary Fungus, of Maunoir; Acute Fungous Tumour, of Sir C. Bell; Galactomyces, of Ritgen; Medullary Cancer, of Travers; Cephaloma, of Hooper and Carswell; Carcinoma Medullare, of Müller; Soft Cancer, of various authors.*]

The terms medullary tumour and soft cancer are chosen for the designation of these tumours because they are in most frequent use, and, though too indefinite, do not, in their commonly accepted meaning, imply anything untrue. The list of synonyms implies that a great diversity of characters is presented by different specimens of the disease. Indeed there are commonly classed under these names all the growths which present the general characters of malignant disease, and have a soft, vascular, and solid texture. It is probable that future investigations will discover characters by which such growths may be arranged under two or more specific titles; but at present there do not appear sufficient grounds for describing them as more than varieties, or forms, or different stages of one species. In the following section, therefore, the specimens are arranged as examples of six different varieties: namely, *a.* the Firm; *b.* the Spongy, Pulpy, Grumous, or Shreddy; *c.* the Brain-like or Encephaloid; *d.* the Cystic; *e.* the Bloody or Hæmatoid; and *f.* the Melanotic variety. The principal characteristics of each of these varieties will be mentioned hereafter.

a. The Firm variety of the Medullary Tumour or Soft Cancer.

In this variety may be included such specimens of the medullary tumour as are characterised by greater firmness and toughness of texture than belongs to the most frequent form of the disease. It is placed first among the several varieties, because it may be regarded as connecting the medullary or soft with the scirrhous or hard cancer. Together with its firmness, this variety usually presents, on section, a fibrous or fasciculate appearance, with a closer texture, and a smoother and more glistening surface than any other variety of the disease.

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* The above list of synonyms is taken from 'The Nature and Treatment of Cancer: by Walter Hayle Walshe, M.D.' &c. London, 1846. 8vo. p. 10. Dr. Walshe names the species, Encephaloid or soft Cancer, and enumerates seven distinct varieties: namely, *a.* Mastoid Cancer; *b.* Solanoid Cancer (both of which would be included under the Firm variety here described); *c.* Milt-like Cancer (here included under the Brain-like variety); *d.* Nephroid Cancer; *e.* Fasciculate Cancer; *f.* Hæmatoid Cancer; and *g.* Fungus Hæmatodes; of which the two latter are here referred to by similar names.

252. Section of a great toe, and of a tumour closely surrounding, but apparently not springing from, the last phalanx. The tumour forms a large, irregularly oval mass, of which the greater part of the surface, exposed by ulceration of the integuments, is covered with coarse wart-like granulations, and a thin greyish layer, of either lymph or slough. Except at its surface, which is rather softer, the whole tumour consists of a pink and white, firm, tough, elastic substance, of uniform close texture, and very vascular. Most parts of it, also, have an obscurely fibrous appearance, as if fibres radiated from its base towards its surface. The margins of the portion of the tumour which is exposed and ulcerated are sinuous, and overhang the skin through which it protrudes; while the skin itself is thickened, everted, and closely adapted to the margins of the protrusion.

The patient was a labourer, forty-three years old. His father died with cancer of the lip: his maternal grandfather with disease of the great toe, believed to be similar to this. The disease commenced about four years before the removal of the toe, when the nail, without any previous pain, fell off. Successive desquamations of thick cuticle from the bed of the nail then ensued, and continued for a year and a half, when the toe became the seat of lancinating pain, and watery fluid was discharged from a superficially ulcerated surface beneath the desquamating cuticle. About a year before the toe was removed the discharge increased greatly, and the surface from which the nail separated became swollen, hot, and more painful. From this time the enlargement, pain, and discharge regularly increased; the growth presenting always an ulcerated ash-coloured surface, and occasionally bleeding. In the last month the hæmorrhage became so frequent and copious that the patient was greatly reduced by it. After the amputation of the toe he recovered, and his inguinal glands, which had been enlarged, resumed their natural size.

Presented by Robert Ceely, Esq.

Specimens of the Firm variety of the Medullary Tumour in other parts of the Museum:—

On bones, 835-6-7.
On the tongue, 1067, 1069.
In the rectum, 1265-6?
 „ liver, 1401-2-3.
 „ lungs, 1792?
 „ kidney, 1905-7-8.
 „ brain, 2070-5-6-7, 2137.
 „ membranes of the brain, 2134-5-6-7
 „ testicle, 2393.
 „ penis, 2607-8.

b. The Spongy, Pulpy, Grumous, or Shreddy variety of the Medullary Tumour or Soft Cancer.

Most of the descriptions of medullary cancer seem to have been drawn from examples of this, which is the most frequent form of the disease, and the specimens of which present the greatest diversity of appearances. The titles ascribed above to it, and the following descriptions of the specimens, will explain the characters which this form presents; and the dissimilarity between the obvious texture of many of the specimens and that of brain, in any condition, will show the propriety of grouping, as examples of a distinct form of the disease, those which are really brain-like or encephaloid; although specimens (such as 256, 257, 265) may be found which connect and confuse the two forms by presenting appearances combining those characteristic of both.

253. Sections of an oval tumour, nearly three inches in its chief diameter, which was removed from beneath the fascia of a thigh, near the capsule of the knee-joint. The surface of the tumour is regular, or very slightly lobed; its texture is uniformly soft, remarkably sponge-like, with fine, soft, shreddy filaments partially enclosing small irregular spaces, and hanging loosely on the cut surface. The skin over the tumour is widely ulcerated; and the surface of the tumour, thus exposed, presents the same spongy texture and appearance as its interior. The rest of its surface is closely united to the adjacent parts.

The patient was a man forty-seven years old, and the disease had been gradually increasing for three years previous to its removal. About six months before that event, it grew painful, and presented a nodulated appearance beneath the skin, which became purple. A surgeon some time after this punctured the tumour: blood alone flowed, and afterwards a *fungus* grew from the wound, which increased and bled so profusely as to endanger the life of the patient, whose health was already much impaired. The tumour was now removed, but the wound made in the operation did not heal: tumours grew in it, and yielded an offensive ichorous discharge. With these the patient sank. After death no similar disease was found in any other part of the body, but portions of the cœcum and colon were ulcerated.

From the Museum of George Langstaff, Esq.

254. Sections of a liver, and of large tumours imbedded in its substance. The largest and most distinct of these tumours has a well-defined circular outline: it is three inches in diameter, and the surface of its section is like that of a sponge, with minute spaces between fine fibres and lamellæ of a very tough tissue, out of which spaces a cream-like fluid was pressed. The other tumours have the same characters less distinctly marked. The surface of the liver is covered with false membrane.

From a gentleman who had ascites.

From the Museum of George Langstaff, Esq.

255. Part of a large, soft, vascular tumour, formed beneath the integuments of the brow, and pressing the eye downwards. The posterior part of the tumour is broken, and presents a coarse, shreddy, and flocculent surface, with grains and little pieces of a soft grumous substance sticking to the filmy threads that hang loosely from it. Its cut surface has a grumous aspect, and is pale, with blotches of livid blood-colour, as if some portions of it were very vascular or had blood effused in them. *Hunterian.*

256. Section of a knee-joint, and of a tumour filling the popliteal space. The tumour is completely isolated from the surrounding textures, which are all healthy, except that those immediately surrounding it are condensed into a kind of cyst. The deepest part of the tumour consists of a firm close-textured substance, pure opaque white shaded with light pink, and presenting a smooth and rather glistening cut surface, like that of brain. In the rest of the tumour are a few scattered portions of the same

texture; but the greater part is of a light brownish or ochre-yellow colour, soft, grumous, and in some situations broken. Just beneath the popliteal fascia, which is stretched over it, the substance of the tumour is completely broken down; and below this part there is an empty membranous cyst, which, it is probable, was filled by serous fluid. The blood-vessels have been injected, but few are traceable in the tumour.

Presented by Sir William Blizard.

257. The other section of the tumour last described.

258. Part of the walls of a chest, with a section of a tumour about seven inches in diameter, and irregularly spheroidal in its shape. The primary seat of the tumour cannot be determined; but part of the right lung is intimately adherent to it. In its growth the tumour has destroyed the costal cartilages and the adjacent parts of the ribs, and has formed a large swelling under the pectoral muscles and the integuments of the right breast. In structure the tumour nearly resembles the softer portion of that last described, having a soft grumous cut surface, which looks as if minute granules of cancerous matter filled the meshes of a sponge-work formed by delicate and filmy fibro-cellular tissue.

Presented by Sir William Blizard.

259. A foot, on the outer side of which is a large tumour. Sections of the tumour exhibit a soft grumous substance, arranged in small lobes or nodules, and of a pale brownish-yellow colour. It is situated immediately beneath the skin, which has ulcerated over a portion of its surface.

Presented by Sir B. C. Brodie.

260. Section of a tumour removed from a man's neck. It is of somewhat oval form, four inches in diameter, knobbed on its surface, and invested by a dense membrane. Some of the fibres of the *sterno-mastoid* muscle are attached to one of its surfaces. The upper half of the tumour is of rather firm texture, greyish, with bundles of glistening white fibres radiating through it, and having their interspaces full of a grumous-looking medul-

lary substance. The lower half is much softer. It had a pulpy reddish aspect, and minute cysts are scattered through some parts of it; but the medullary substance of which it is chiefly composed is like that in the upper half.

The tumour had existed four years, and had grown rapidly during the last six months. In its removal the sheath of the carotid artery and jugular vein was exposed for two inches. It nearly touched the subclavian artery below, and the parotid gland above. The patient recovered from the operation.

From the Museum of Robert Liston, Esq.

261. The upper part of a skull, in which are several lens-shaped medullary tumours, from half an inch to two inches in diameter. The largest of them are bi-convex, having grown both without and within the skull. The bone between them is full of the same morbid substance, ulcerated, broken, and crumbling. The smallest tumours are situated only on the exterior of the skull, and all project more outwards than inwards. Their texture is pale, dull yellowish and pinkish white, soft, elastic, and spongy. Their cut surfaces present an obscurely fibrous appearance, as if slender shreds and filaments passed vertically from the base or centre to the surface of each tumour, and served as a bed for soft, grumous, and pulpy cancerous matter. The pericranium and dura mater are stretched over the tumours, but are healthy; as are, also, those parts of the bone on which no tumours are seated.

Presented by Robert Keate, Esq.

262. Part of a foot, and of a large, lobed, vascular tumour, which occupied its anterior and inner half, and formed a considerable swelling on the inner side of the sole. The growth of the tumour seems to have commenced deep in the sole. It is distinctly circumscribed, and the adjacent tissues appear healthy. From the cut surface of the tumour many delicate and flocculent shreds, like blood-vessels and fibro-cellular tissue, hang loose; and its whole substance appears as if a soft, grumous, and opaque yellowish substance were imbedded in a texture formed of similar shreds and films.

From the Museum of Robert Liston, Esq.

263. A kidney, the pelvis of which is filled and dilated by a soft, spongy, and flocculent tumour with a rough surface, as if ulcerated. The surrounding lining membrane of the pelvis is deeply and unevenly ulcerated like the surface of the tumour; as is also the lining of the infundibula, many of which are dilated. The substance of the kidney is in great part removed, and the remaining portion contains some softened medullary deposits. *Hunterian.*

264. Part of a rib, around which is a lens-shaped medullary tumour.

It was taken from the same patient as the specimen last described. The following history was recorded by Mr. Hunter:—

"*Mr. Hodges.—Diseased Kidney.*

"Mr. Hodges, surgeon, aged forty-six, had for six years made bloody water, which however he had taken great pains to conceal. Any other symptoms, therefore, that might attend it are unknown, only that he was worse after much fatigue, particularly horse exercise.

"For a year before his death, he lost flesh and was evidently in ill health, but made no complaint, nor did he take any medicinal advice till a month or two before his death, when he had considerable pain in his right side, which he wished to persuade his friends was rheumatism; but upon examination, the liver was considerably enlarged. He sunk into a very low state, with a small quick pulse; and after being for about a fortnight in this state he died.

"On inspecting the body, the liver was found enlarged considerably, both in its great and small lobe, and had a number of projections on its surface like abscesses, of a whitish colour on the projecting part. These, upon being cut into, did not contain matter, but a species of new-formed substance, something resembling cancerous tumours coming to suppuration, or rather an appearance which in some respects resembled scrofula, in others, cancer.

"The lymphatic glands, running up the loins on the left side, were much enlarged by the same species of disease, and the left kidney was very considerably affected in the same way, one part of the substance being made up of the same tumour as the liver, and the rest being encysted; but the pelvis was filled up by a large, spongy, loose excrescence, attached to one side of the cavity. It was about the size of a hen's egg, its texture apparently resembling sponge; the external surface extremely irregular.

"From the symptoms, this fungus must have been six years in forming; and probably the disease in the kidney had been continued to the glands on the side of the spine, and thence to the liver, but the immediate cause of death arose from the affection of the liver.

"The rest of the abdominal viscera were in a natural state. The kidney on the right side was sound, and even the ureter of the diseased one. The thoracic duct was unaffected, and on the left side the lungs had small tubercles on them. Two of the ribs of the left side were attacked by the same disease, about three inches from their heads; and for the space of two inches the bone at that part was absorbed, and the space filled by a species of soft tumour.

" On the opposite side of the body there was a small lump immediately under the skin, and appearing externally through the skin of the size of a nut, and similar in its internal structure.

" By the different parts that were diseased it is evident that it was not propagated by the common mode of absorption, but that different parts of the body were so disposed as to take on the diseased action."—*Hunterian MS.*: '*Cases and Dissections*,' No. 71.

265. A bladder and prostate gland, with the adjacent parts, laid open from the front. The bladder is very large, and thin-walled. Nearly all its cavity is occupied by a tumour, growing on a broad base from the mucous membrane of its neck and posterior wall. The tumour is nearly spherical, about four inches in diameter, soft, in some parts brain-like, in others more flocculent, and with an obscurely fibrous texture. At one part it is blotched with blood effused in its substance; and its surface is uneven and flocculent, as if ulcerated and softened. The lining membrane of the bladder, and all the adjacent parts, appear healthy.

From the Museum of R. B. Walker, Esq.

The patient's kidney, with a calculus, is preserved in No. 1943.

266. A stomach inverted, and exhibiting on its interior an elevated oval tumour, probably a medullary cancer, which has a flat but irregular, lobed, deeply fissured, and granulated wart-like surface. It is attached by a constricted base to apparently healthy mucous membrane.

The patient was a married woman, who had a large cyst containing nearly four gallons of fluid in the left ovary. All the other organs were healthy.

From the Museum of John Taunton, Esq.

267. A woman's stomach, in which a considerable part of the anterior wall is occupied by an ulcer, which probably had its origin in a medullary cancer, with a thick, elevated, sinuous margin, and a coarsely granulated base. The lymphatic glands along the lesser arch are enlarged; and

a part of the liver is closely adherent to the peritoneal surface of the stomach, opposite the seat of the tumour. The rest of the stomach is healthy.

The jejunum of the same person is preserved in No. 1192. Its coats are thickened, and its mucous membrane lined by lymph.

Symptoms of disease of the stomach had existed twenty-five years.

Hunterian.

268. Parts of a liver, small intestine, omentum, and testicle, affected with medullary disease. In the portion of liver a small spherical mass of medullary substance is seated just beneath its surface. With the intestine are several small spheroidal tumours, with shreddy surfaces, attached by broad bases to its peritoneal coat and to the mesentery. The omentum is thickly beset with groups of smaller growths of the same kind. In the testicle none of the natural texture can be discerned; and in its place is a large mass of medullary substance, divided by wavy partitions into many nearly distinct round portions. *Hunterian.*

269. Section of a foot, on the sole of which there is a large, pale, ulcerated and broken medullary tumour. The base of the tumour extends to the metatarsal bones; and in its growth it has involved all the tissues between them and the skin.

270. Another section of the same foot and tumour.

Mr. Hunter thus described the preparation:—

"This is the foot of a patient I had in St. George's Hospital: you see from the sole of the foot what a considerable quantity of this dark fungus arises. In this case there was no disease of the lymphatics proceeding from the foot; but, about a fortnight after the amputation, the stump swelled amazingly; that however went off, and the patient mended very fast."—*Parkinson's Hunterian Reminiscences*, p. 162.

271. Sections of a large ulcerated medullary tumour, which grew from the margins of a cicatrix formed after extirpation of a diseased testicle.

The preparation was shown by Mr. Hunter in his lectures, together with that last described, as "the same kind of fungus arising from the testicle." The following account of the case is published by Sir Everard Home in his 'Observations on Cancer.' London, 1805. 8vo. p. 120, Case XXXI.:—

"*Of Cancer in the Testicle, in which the contaminated Skin of the Scrotum became a Fungated Sore.*

"A chairman had a swelled testicle, which increased to a considerable size, not attended with much pain, as the spermatic chord remained of its natural texture. It was suspected to be scrofulous. The skin became affected, and adhered to the body of the testicle, particularly on the fore part.

"It was extirpated, with a good deal of the attached skin, but not the whole of it. The wound healed very readily, and remained sound for about two months: it then broke out, and began to throw out a fungus from the edges of the old skin, all round the cicatrix. This fungus went on increasing till it was larger than an orange: the more external part of which dried and crumbled off, which often produced a profuse hæmorrhage at the time. The man's health became impaired, and he lost, in some degree, his senses. In this state, arsenic was tried in powder, mixed with three parts of flour, made into troches: these were inserted into its substance in several places, but did not appear to have much more power in lessening the tumour; and he died.

"On examining the parts, after death, it was found that this fungus had arisen from the edges of the cicatrix, or old skin, and not from either the surface of the sore, or the end of the spermatic chord; both of which, however, had ulcerated, so as to be in the state of a common sore, but did not shoot out any of this fungus."

272. Part of a head, in which, in consequence of the growth of a tumour, probably of medullary nature, in the left antrum, there has been a complete removal of the floor of the orbit and of the hard palate of the same side. The outer part of the left superior maxillary bone, and the inferior turbinated bone, have also been destroyed. There is ulceration on both sides of the septum of the nose; and a great aperture in the cheek, extending from the upper lip to the margin of the lower eyelid, and from the side of the nose to the malar bone, has exposed the effects of the destruction of the internal parts.

The patient was a soldier, sixty years old. He had had disease of his lungs for six months before his death, and had nearly died with hæmoptysis. The tumour of the antrum was first observed about three months before his death. It protruded at both the cheek and the palate, and formed large, sloughing, and bleeding fungous growths in both these situations; but before his death the whole of the morbid growths sloughed away, and the ulcerative process alone made progress.

The lungs after death were found full of medullary tumours. The liver was large and granulated. The other organs were healthy.

From the Museum of George Langstaff, Esq.

Specimens of the Spongy or Pulpy variety of the Medullary Tumour in other parts of the Museum :—

In or upon bones, 825 to 834, 838, 839, 842 to 845, 1056.
Connected with the jaws, 1053-4-5-7.
In or upon the pharynx or œsophagus, 1093 to 1103, 1170.
" stomach, 1165 to 1174.
" intestines, 1220 to 1225, 1267 to 1275, 1276?
" liver, 1404-5.
" lymphatic glands, 1473.
" thyroid gland, 1505-6.
" lung, 1793, 1796.
" larynx, 1859?
" kidney, 1906, 1909, 1910.
" bladder, 2002 to 2009.
" brain, 2069, 2071-2-3-4.
" membranes of the brain, 2140?
" nose, 2210, 2210 A.
" eye, 2240 to 2245, 2251-2.
" skin, 2303-4.
" testicle, 2396 to 2417, 2468.
" spermatic chord, 2462-3.
" prostate gland, 2517-8.
" penis, 2609? 2610? 2614.
" ovary, 2638, 2639, 2640.
" uterus, 2696 to 2705.
" breast, 2796.

c. Brain-like or Encephaloid variety of the Medullary Tumour or Soft Cancer.

A close resemblance, in its general appearance, to the white substance of brain, is the character by which this is distinguished from other varieties of the species. A certain degree of likeness to cerebral structure, consisting chiefly in the softness of their substance, belongs to the specimens of the foregoing as well as to those of this variety; and the two varieties together comprise so large a proportion of the tumours here included under the name of medullary, that the whole species has been by many designated, after this its most usual character, cephaloma, or encephaloid tumour; but the name *brain-like* is here applied exclusively to those specimens of which the resemblance to brain is well marked in colour, consistence, and apparent texture.

273. Section of a large, oval, and rather lobed tumour removed from a lady's leg. It has a nearly pure white colour, and in texture is just like the white substance of a firm brain; uniform, smooth on its cut surface, with

the orifices of small vessels irregularly scattered in it, but with hardly any appearance of shreds or fibres. Part of the tumour has protruded through the ulcerated integuments, and its surface is covered with blood. There are also some parts of the interior of the tumour darker than the rest, in which probably blood had been effused.

From the Museum of Sir A. P. Cooper.

274. Section of a smaller tumour of the same kind, removed from the same part.

This tumour formed first; that last described was produced by a recurrence of the disease after this had been removed.

From the Museum of Sir A. P. Cooper.

275. Section of a tumour, removed with a portion of the integuments of the back, to which it was attached by a narrow base. The tumour is oval and lens-shaped; it measures five inches in its chief diameter; its margin, which overhangs its base on every side, is superficially lobed. It is composed of a uniform brain-like substance, broken in some places, but elsewhere pale, close-textured, and smooth on its cut surface. The skin over the exposed part of the tumour appears involved in the disease, and is superficially ulcerated.

The patient was a soldier, forty years old. The tumour formed in consequence, apparently, of the pressure of the knapsack. It was considered at first to be a fatty tumour, but it gradually assumed a more malignant aspect. The skin over it ulcerated many years before its removal. After its removal the patient recovered.

From the Museum of Robert Liston, Esq.

276. Sections of a tumour removed from a woman's back. The tumour is lens-shaped, an inch and a half in diameter, and constricted at its base. It is partly covered by skin, the papillæ of which are enlarged. Its cut surfaces present the appearance of a soft, uniform, brain-like substance; and, except in being smaller, it closely resembles that last described. *Hunterian.*

Specimens of the Brain-like variety of the Medullary Tumour in other parts of the Museum:—

In or upon bones, 824.
Connected with the jaws, 1052, 1058.

In the lungs, 1794-5.
" eye, 2246 to 2250.
" testicle, 2394-5.
" breast, 2795.

d. Cystic variety of the Medullary Tumour or Soft Cancer.

The existence of cavities or cysts with well-defined smooth walls in the substance of medullary tumours, is not a rare occurrence. They are sometimes so numerous or so large that the space occupied by one or more of them is greater than that filled by the solid portion of the growth; in which case they produce an appearance sufficiently peculiar to form the characteristic of a distinct variety of the disease. The solid portion of such tumours, lying between the proper membranous walls of the cysts, may have the characters of any of the other varieties of the medullary tumour; it may be firm, pulpy, brain-like, or melanotic. The contents of the cysts may be like softened medullary substance, or like serum, or blood, or half-fluid jelly of various colours. According to these diversities of their constituent materials, numerous varieties of the disease might be enumerated; and there is scarcely less diversity in the respective proportions of the medullary or solid matter and the cysts; for while in some cases the cysts are sparingly interspersed in the substance of the tumour (as in 278 and 847), in others the medullary substance can hardly be discerned, and the disease appears like one cyst, or a congeries of cysts, bounded only by their proper membranous walls (as in 279, 281, and 849).

277. Section of a tumour removed from the posterior part of the thigh. It was of an oval form, three inches and a half in length, and, except at its base, covered by skin alone. It is almost wholly composed of numerous closely packed and variously shaped cells or cysts, some filled with blood, others with bloody fluid. The walls of the cysts and the layers of tissue intervening between them are thin, formed chiefly by a pale brownish, soft medullary substance, and smooth and polished on their inner surfaces. The skin covering the most exposed part of the tumour is ulcerated.

The patient was a woman, forty-five years old. The tumour had been three years in progress, without pain, but with much impairment of the health. Blood, sometimes as much as a pint at a time, was discharged two or three times a week from the ulcerated surface of the tumour.

From the Museum of George Langstaff, Esq.

The other section of the tumour is in the Museum of St. Bartholomew's Hospital.

278. Sections of a large lobulated tumour, removed from the neck of a child. It consists apparently, like that last described, of a medullary substance, with numerous mutually compressed cysts. *Hunterian.*

279. "A congeries of encysted tumours which formed between the scapula and ribs of a woman at St. George's Hospital" [*Hunterian MS. Catalogue*]. It is a mass of irregular form, measuring about five inches by three, and chiefly consisting of many large thin-walled cysts. The cysts which have been opened are partly filled with a broken, flocculent, and shreddy substance, like that of a soft and grumous medullary tumour. *Hunterian.*

280. A similar tumour from the same person. It is much larger than the preceding. About half of it consists of cysts like those last described; and the rest is composed of soft, broken, and flocculent medullary substance. *Hunterian.*

281. A cyst removed, with a portion of integument, from the upper and inner part of a man's thigh. The cyst is nearly three inches in diameter; its walls are in most parts half a line in thickness; its internal surface is unevenly fasciculated; and its cavity, which was filled with "a bloody gelatinous fluid," is traversed by a few imperfect partitions. Immediately beneath the skin, a part of the anterior wall of the cyst is nearly an inch in thickness; and this part is pale yellowish and white, uniform, close-textured, and like brain with spots of blood in it.

The patient was fifty-eight years old. The tumour, commencing with a small nodule in the skin, had been in progress five years. It was not painful till in the last year, during which it increased rapidly, producing shooting pains in the thigh, and great suffering.

From the Museum of R. B. Walker, Esq.

Specimens of the Cystic variety of the Medullary Tumour in other parts of the Museum :—

In or upon bones, 846 to 850.
„ the eye, 2259.

e. The Bloody or Hœmatoid variety of the Medullary Tumour or Soft Cancer.

The extensive effusion of blood into their substance, or a great degree of congestion of their blood-vessels, may give to the specimens of either of the preceding varieties the character which distinguishes this. The single specimen placed here as an example of the variety shows peculiarly well the changes produced in parts of a brain-like medullary tumour by exceeding vascularity, by effusion of blood, and by the alterations which the blood undergoes subsequent to its effusion. It illustrates also the mode in which the characters of "Fungus Hæmatodes" and "Bleeding Fungus" are acquired by tumours of this kind; for the internal hæmorrhage here shown differs only in situation and degree from the external hæmorrhage by which the tumours so named are commonly distinguished.

281 A. Section of a knee, with a great brain-like medullary tumour, which, commencing in the head of the tibia, has grown out through its expanded walls, and imbedded itself in the tissues of the ham and at the sides of the knee-joint: one of the condyles of the femur is shown projecting from the middle of the section. The tumour is of an irregularly oval form, deeply lobed on its surface, and on its section displays partitions dividing it into many round masses corresponding with the lobes of the external surface. It measures about eleven inches by eight. Its whole mass appears to be composed of a close-textured soft substance, inelastic and easily crushed, which has just the consistence of healthy adult brain. In many parts, also, it has the same uniform pure whiteness as brain; but in other parts blood has been copiously effused in its substance, giving it various shades from crimson to black, and making parts of it look like brain with apoplectic effusions; and again, in other parts, where probably blood had been effused at several periods previous to the amputation, the substance of the tumour, softened and more grumous, presents the various red and rust-coloured shades through which effused blood commonly passes towards decolorization. The adjacent parts are not altered in their texture, but are closely adherent to the whole circumference of the tumour.

The patient was a shoemaker, thirty-eight years old. The disease was first observed eleven months before the amputation of the limb. Three months after the amputation, when the stump had completely healed, the patient died with acute pneumonia. There was no external appearance of the disease having recurred.

Presented by Thomas Salt, Esq.

Several specimens of medullary tumours, already described or referred to in preceding sections, present small effusions of blood in their substance; and therefore differ only in degree from the specimens of this variety. Such are 255, 265, 277, 844, 848, &c. Growths bearing analogy to these, in being the sources of profuse hæmorrhage, as well as in some similarity of structure, are Nos. 840-1, 302 A, 2005, 2006.

f. The Melanotic variety of the Medullary Tumour or Soft Cancer.

[Melanoma; Melanosis; True Melanosis.]

All the specimens of melanotic disease in the Museum appear to be examples, either of tumours which, in addition to the general characters of medullary disease, present more or less of blackness from the deposit of colouring matter, like black pigment, in their substance; or of deposits of black colouring matter in the organs of persons in whom such tumours existed. The specimens in the following group are arranged according to the degrees in which the medullary substance which forms the basis of the tumour is blackened by the melanotic matter; so that they show several stages of transition from the pale nearly colourless tumour, through such as are, in deepening shades, mottled with grey, brown, or black, to those in which an intense blackness pervades the whole mass.

282. Sections of a tumour removed from behind the angle of a jaw. It is of an oval shape, smooth on its outer surface, and invested by a thin but dense and tough capsule. It measures nearly three inches in its chief diameter, and its interior is arranged in many lobes. Half of it is composed of a uniform pale, close-textured, medullary substance. The other half, separated from the preceding by a definite line similar to others by which the tumour is partitioned into lobes, is composed of the same pale substance, mottled, in various and mingling shades of grey and black, by melanotic matter. *Hunterian.*

The following account of the case is published by Sir E. Home in his 'Observations on Cancer.' London, 1805. 8vo. p. 48, Case VIII. :—

"A gentleman, about thirty-five years of age, had a tumour formed behind the angle of the lower jaw, which was considered as an enlarged lymphatic gland. This increased so much in size as to induce him to have it removed. Three years after, a second tumour was observed in nearly the same situation: this was slow in its increase, but gradually enlarged to the size of a pullet's egg. It was insensible to the touch, and gave neither pain nor uneasiness. While it was it this state he went to Vauxhall; and being engaged in a drunken squabble, received a violent blow with a stick upon the tumour. The blow produced no injury to the skin, but the tumour very rapidly increased, and in a few weeks had doubled its original size. It was removed by Mr. Hunter, and afterwards examined. On making a section of it, the original tumour was white in its substance, and of an uniform texture; the part formed since the accident was spongy and soft, of a dark black appearance, resembling what is commonly termed a cancerous fungous excrescence; and an exact line, the whole breadth of the tumour, separated the two appearances.

283. Sections of a tumour removed from the back. It has a lobed and nodulated surface, a narrow base of attachment, and an irregular outline; but its general form is lens-shaped, like No. 276. It is composed of a smooth and close-textured brain-like medullary substance, which is streaked and shaded by lines and dots of melanotic matter, dividing it into irregular lobes. The tumour appears to have grown in the cutis, and to have protruded through its surface. *Hunterian.*

284. Section of a cluster of lymphatic glands taken from near the right external iliac vessels. One of them is greatly enlarged, and its natural texture has been completely replaced by a soft, obscurely fibrous, and spongy medullary substance. The original colour of the diseased mass appears to have been nearly pure white; but melanotic matter has been deposited in fine dots in many parts of it, giving it various hues of pale and deep grey, brown and black. Some deposits in it, also, have a yellowish brown colour. The other glands are also enlarged, but in a much less degree, and are filled with medullary matter uncoloured by melanotic deposit.

From a young man whose liver was immensely enlarged by numerous soft, deep black, melanotic tumours, which appeared to have been formed in three months. In these tumours in the liver there was not a trace of pale medullary substance, although in texture they resembled this growth.

Presented by James Paget, Esq.

The other half of this specimen, with a drawing of the liver, is in the Museum of St. Bartholomew's Hospital.

285. A small, soft, grey and black melanotic growth on the skin.

It was removed from a man's shoulder, where it had existed in the form of a *mole* from birth.

From the Museum of George Langstaff, Esq.

286. A tumour removed after death from the axilla of the patient from whom the preceding specimen was taken. The tumour is globular, lobed, and nodulated, nearly six inches in diameter, and four pounds in weight. Half of it is covered by integument, which has sloughed extensively at the most exposed part. The axillary vessels and nerves also are attached to the surface of the tumour, but are not much compressed. The texture of the tumour, which consists almost entirely of small round masses clustered together, is very soft and loose; slender shreds hang from its cut surfaces; and the medullary substance of which it is composed is variously shaded with grey, brown, and black, by melanotic matter. At the parts nearest to the surface over which the skin has sloughed, the tumour is pale, with scarcely any mixture of melanotic matter. In the deeper parts it is dark grey, spotted with black. Near the surface, also, there are spaces which contained blood.

From the Museum of George Langstaff, Esq.

287. Sections of a rib, in which part of the cancellous texture is full of brownish and black medullary and melanotic substance, portions of which also project in a small tumour from its surface.

The three preceding preparations, as well as Nos. 851-2, and 1409, were taken from a patient whose case is recorded by Mr. Langstaff in the 'Medico-Chirurgical Transactions,' vol. iii. p. 277. London, 1812.

The patient was a sallow-complexioned man, thirty years old. Nearly two years before his death the small tumour on the shoulder [No. 285] ulcerated and became subject to occasional bleedings. It was removed five months before death, and the wound of the operation healed slowly. After this, two tumours, which had appeared in the axilla a fortnight before the operation, united and gradually enlarged, producing, after a month, great and increasing pain and disturbance of the health, and at length forming the great mass in No. 286. During the progress of this tumour, a portion of the distended skin ulcerated, and gave almost constant issue to the discharge of large quantities of blood and ichor; while other tumours of smaller size formed under the skin about the principal one, and in other parts.

288. Sections of two small, soft, brown and black tumours, composed of medullary substance, with a general and abundant deposit of melanotic matter in it.

The patient was a man fifty-nine years old. This tumour was seated between the umbilicus and pubes, and seemed to have its origin in a small *mole*, which had undergone no change from birth till about a year before death. It then enlarged, became dark brown and firm, ulcerated superficially, and discharged fœtid ichorous fluid. It was removed, together with several small dark growths which had formed around it, and the wound healed; but in six weeks the tumour was reproduced from the cicatrix, and other small growths again formed in and beneath the skin around it, and increased in number, till in two months they amounted to at least forty, and extended from one ilium to the other, "like a large bunch of dark-coloured grapes." At the same time, as this disease made progress, and the general health became slowly more impaired, other tumours appeared near a *mole* on the sternum, and on the sides and back of the trunk, the scalp, and forehead. At length, gradually increasing dyspnœa and cough came on, and were followed by general dropsy, under which the patient sank within a year from the first increase of the mole. After death, numerous melanotic growths or deposits were found in the heart (a part of which is preserved in No. 1530), in some of the bones, in the peritoneum, the mesenteric glands, pancreas, liver, kidneys, and lungs.

The father of this patient had died with numerous small tumours between the shoulders; and his children and brothers, as well as his father, had many moles on various parts of their bodies.

A further account of the case is given by Dr. Norris in the 'Transactions of the Provincial Medical and Surgical Association,' vol. iv. p. 437. London, 1836. The other section of the tumour is in the Museum of Saint Bartholomew's Hospital.

Presented by Dr. Norris.

289. Portions of omentum and liver, in which there are numerous small, round, soft, melanotic tumours, from a line to a quarter of an inch in diameter. The textures adjacent to the morbid substance are healthy.

They were taken from the patient whose case is described in 'A Case of Melanosis, with General Observations,' by Thomas Fawdington. London, 1826. 8vo.

He was a man thirty years old. Seven months before his death his left eye was extirpated on account of a melanotic tumour which had been growing in the globe for probably nine months. He recovered from the operation; but four months afterwards black tumours appeared in the skin of the face and back, he began to have dyspnœa and cough, and his general health failed. After this the liver became exceedingly enlarged by melanotic tumours formed in it; small tumours appeared beneath the integuments of all parts of the patient's body, and he gradually sank. After death, almost every organ in the body was found affected with melanosis.

Part of the kidney of the same patient is preserved in No. 1911.

From the Museum of George Langstaff, Esq.

290. A section of the tail of a horse, and of a large, lobulated, soft, pale-brown and black tumour imbedded deeply in its substance, and projecting in lobes and nodules on its surface. *Hunterian.*

291. Section of a melanotic tumour removed from the neck of a horse. It is deep black throughout, moderately firm, lobulated, and on its cut surface rather shreddy.

Mr. Hunter thus recorded this case:—

"*Of extracting a Tumour from a Horse's Neck belonging to Mrs. General Pitt.*

"The tumour was on the near side of the neck, lay immediately on the inside of the jugular vein, where they commonly bleed, and the vein was plainly seen passing over it. It was about eight or ten inches long in the direction of the neck, and about four or five thick. It was loose, not attached but by loose cellular membrane.

"I made an incision along the neck by the side of the vein to the tumour, and in the separation of the surrounding parts, I found that the carotid artery was also on the outside of the tumour. It was very large, about half an inch in diameter; nor did it contract by not allowing the blood to flow into it; rather became flat. Its pulsations were soft, and it was easily compressed, or the blood easily stopped in its passage by the finger. I thought it would be best to tie it up, for fear of accidents, therefore tied a ligature round it; but immediately the horse appeared vastly oppressed, breathed with great difficulty, so much so that I suspected that I had tied up with the artery the par vagum. I therefore loosened the ligature, but left it on. He then became more lively, and breathed with ease.

"I then went on with the operation, and extracted the tumour, and the wound was dressed up. But when we wanted to raise him on his legs, he only raised himself on his fore legs, and did not in the least move the hind ones. It was imagined that he was only cramped from having been flung and tied during the operation, and therefore was obliged to let him lie quiet; but he never moved them afterwards, and he died the next evening.

"On opening the body and the wound there was nothing to be seen that could in the least account for the loss [of the use] of his hind legs, nor for his death.

"I took out the piece of carotid artery, with the ligature still surrounding it, but loose, to see if I had enclosed the nerve within it, and I found I had, which accounted for those symptoms already mentioned; and I also observed that the carotid artery, which was, when alive, about half an inch in diameter, was now not a quarter, which must have arisen from the stimulus of death.

"The tumour was of a very dark colour; and when cut into and squeezed, a black fluid, exactly like ink, came out on the cut surface. It blackened the water it was steeped in for a considerable time."—*Hunterian MS.*: '*Cases and Dissections,*' No. 86.

The nerve and artery mentioned in the foregoing case are preserved in No. 2164.

292. Sections of four black and brown, soft, nodulated tumours removed from different parts of the body. They all present on their cut surfaces an appearance of divisions as if from partitions radiating in wavy lines from the centre, with various shades of black and brown, and loose soft shreds hanging from them. *Presented by Sir B. C. Brodie.*

Specimens of the Melanotic variety of the Medullary Tumour in other parts of the Museum :—

In or upon bones, 851-2.
In the liver, 1409 to 1411.
„ heart, 1530.
„ kidney, 1911, 1912.
„ brain, 2078, 2258.
„ eye, 2253 to 2259.
„ ovary, 2642, 2642 A.

9. *Alveolar, or Gelatiniform Cancers.*

[Gelatinous Degeneration, of Laennec;[*] Areolar Gelatiniform Cancer, of Cruveilhier;[†] Gum-Cancer, of Hodgkin; Carcinoma Alveolare, of Müller; Colloid or Jelly-like Cancer, of Walshe.]

The disease to which these several names have been applied presents, in most instances, such nearly uniform appearances, that the description of the specimens of it will comprise all its obvious essential characters, and will sufficiently detail the particulars in which it differs from the species hitherto described.

293. A portion of omentum affected with alveolar or gelatiniform cancer. None of the natural structure can be discerned, except the surfaces of the peritoneum. In its place is a layer three quarters of an inch in thickness, made up of a congeries of small, thin-walled, spherical and oval cysts or cells, filled by a transparent, pale yellowish, viscid substance, like semi-fluid gelatine, or a thick mucilage of gum-arabic, some of which has oozed from the surface, and hangs from it in light cloudy flocculi. The cysts are from one to three lines in diameter; their walls appear to be formed

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[*] Journal de Médecine, Chirurgie, Pharmacie, etc. An xiii. tom. ix. p. 369.

[†] Anatomie Pathologique du Corps Humain: Paris, folio, livraison x. pl. iii. iv.

by delicate fibro-cellular membrane; and the mass they form is intersected by coarser fibro-cellular partitions, which give it considerable firmness and toughness. Many similar cells project slightly beneath the peritoneal covering of the omentum, like transparent spots scattered in the otherwise opaque membrane. *Hunterian.*

294. A mass of the same disease, from eight to ten inches in diameter, removed from the lower surface of a liver. It has no regular shape, but is composed of lobes and nodules of various sizes, invested and united by thin layers of delicate fibro-cellular tissue. The size of the cells composing the morbid structure, and the colour and general gum-like appearance of their contents, are like those in the last described specimen.
Presented by Robert Keate, Esq.

Specimens of Alveolar or Gelatiniform Cancer in other parts of the Museum:—
In bone, 853?
In the peritoneum, 1122 A.
„ stomach, 1175.
„ intestines, 1226.
„ heart, 1531?

10. *Tubercles.*

[The names *Tubercle* and *Tuberculous Matter* are here assigned to the peculiar substance which is commonly described as Scrofulous Tubercle, or as Scrofulous or Caseous Matter, and the progress of which in the lungs constitutes Pulmonary Phthisis.]

Tubercle most frequently appears as an infiltration of a peculiar morbid substance in the tissue of an organ. This is almost always its form when it affects the lungs or lymphatic glands; and since in these and similar cases it does not necessarily give rise to swelling, it is not generally regarded as belonging to the class of tumours. But it must be placed among them on the same ground as the species of cancer are; since, like them, tubercle sometimes (as, for example, in the brain and its membranes) assumes the form of a distinct separable tumour or new growth. Moreover, although tubercle and the three species of cancer already illustrated constantly differ in many apparently specific and essential characters, having relation both to their structure and to the conditions in which they severally occur, yet in all the general characters of malignant diseases already enumerated [pp. 80, 81] they exhibit as constant a resemblance.

The principal forms of tuberculous disease, as shown in the following section, are—first, the tuberculous mass, or distinct tumour, to which belong most examples of the encysted tubercle; second, the miliary tubercle, or tuberculous granulation, which in a later stage assumes the form of the crude tubercle; thirdly, the tuberculous infiltration. But it is to be observed, that although the name of tuberculous infiltration is usually applied to this third form, yet the tuberculous matter in the miliary tubercle is, also, probably always infiltrated in the tissue of the affected organ, so that the conditions and difference between these two forms would be more correctly expressed by the terms *circumscribed* and *diffuse* tuberculous infiltration.

In all these forms the tendency of the tuberculous matter to soften is alike shown, which softening usually commences in the centre of the morbid substance, and is followed by ulceration, extending, in accordance with the usual mode of extension of malignant ulceration, through nearly all tissues. In all of them, also, there may occur changes indicating that the usual destructive progress of the tuberculous disease has been arrested; of which changes the principal are—first, the drying and shrivelling of the tuberculous matter into what have been called *obsolete* tubercles; secondly, the accumulation of earthy matter, composed chiefly of the phosphate and carbonate of lime, in the place of the tuberculous matter; thirdly, the healing of tuberculous ulceration. Most of these changes, constituting both the progress and the retrocession of tuberculous disease, are shown in the following section, or in the specimens referred to at page 138.

294 A. Two sections of a child's cerebrum, in each of which a round mass of tuberculous substance is imbedded. Each mass is about half an inch in diameter, of uniform, compact, firm but friable, pale yellow substance, and smooth on the cut surface. The cerebral substance surrounding them appears healthy, it is separated from them by a distinct boundary line, and could be easily removed from their surface. Part of another similar mass of tubercle, taken from the brain in which it was imbedded, is suspended separately. *Presented by Thomas Wormald, Esq.*

295. Portion of lung, displaying miliary tubercles, in a very early stage, imbedded in its substance. Each tubercle is a mass from a quarter of a line

to half a line in diameter, firm, close-textured, prominent on the cut surface of the lung, of roundish but not regular form, greyish green or dull yellowish in colour, and slightly glistening. The tubercles are scattered at distances varying from a line to half an inch, and some are closely grouped four or more together.

From a patient who died with empyema. Similar tubercles existed in nearly every part of both lungs.

Presented by James Paget, Esq.

296. Section of the apex of a lung, in which there are groups of grey miliary tubercles. The pulmonary capillary vessels have been completely filled by injection of size and vermilion through the pulmonary artery; but neither with the naked eye nor with the microscope can any blood-vessels be discerned within the substance of the tubercles. There is no apparent difference between the pulmonary tissue immediately around the tubercles and that of any other part. *Presented by John Quekett, Esq.*

297. Section of the lung of a benturong [*Arctictis Benturong*]. Tuberculous matter has been deposited in a circumscribed space at and below the surface of the lung. The outlines of this space are formed by the pleura and by the tissue between some of the lobules of the lung, which tissue is thickened, indurated, and opaque white. Several adjacent lobules beyond this space are surrounded by similarly thickened interlobular tissue. Within the space occupied by tuberculous matter there are appearances of its having been first deposited in the interlobular tissue, for the lines in which this tissue lay are filled by firm and compact tuberculous matter. In some of the lobules, also, so much tuberculous matter is deposited that they appear solid and yellowish-white, like masses of tubercle in which none of the original pulmonary texture can be discerned; but in other lobules there remain distinct traces of the air-cells, which appear surrounded by tuberculous matter, as if this morbid substance first surrounded a lobule, and had then gradually spread to its central parts and filled every air-cell in it. The lung has been minutely injected, but no vessels are discernible where the tuberculous matter is deposited.

Presented by the Council of the Zoological Society.

298. Section of a lung, tuberculous in nearly every part. The section has been made vertically through the upper lobe and a portion of the lower lobe of the lung. A narrow oblique white band indicates the complete union of the lobes by a layer of tough adhesions. The lung is enlarged, and made solid and heavy, by a diffuse infiltration of dull yellowish-white tuberculous matter through its whole texture. None of the original texture of the lung can be discerned; scarcely even does a blood-vessel or air-tube appear pervious in it; but it is uniformly solid, and its colour would be uniform were it not for the black matter which was deposited in it before the tuberculous disease, and by which the yellowish hue is variously streaked and shaded with spots and lines of bluish-grey. In a few places small broken-walled cavities have been formed after the softening of the tuberculous matter.

Both layers of the pleura are adherent, thickened, indurated, and opaque; the costal pleura, part of which is reflected, is highly vascular. About the apex of the lung there are, either in the costal pleura or in the adhesions just beneath it, numerous oval, flattened, miliary and crude tubercles, from half a line to two lines in diameter, of a yellowish-white colour, variously scattered, and in many places collected in groups and larger masses. *Presented by James Paget, Esq.*

299. Section of the upper lobe of a lung, the whole of which, by tuberculous infiltration, is rendered uniformly solid, heavy, and friable. The dull pale yellowish colour of the tuberculous matter is varied only by the spots and lines of black pigment previously deposited in the lung. Nothing can be seen, with the naked eye, of the proper substance of the lung, except the orifices of some of the larger blood-vessels and bronchial tubes. *Presented by James Paget, Esq.*

299 A. A lung, showing the destructive effects of tuberculous ulceration. The substance of both lobes has been so destroyed that there remains in the place of each only a large sac, the walls of which, from one to three lines in thickness, are formed by thickened pleura, and a thin layer of lung infiltrated with tuberculous matter. The internal surfaces of these sacs are intersected and coarsely reticulated by branching ridges and cords

formed by the obliterated large blood-vessels; and many similar cords or bridles pass across the cavities from one wall to another. The cavities are lined by a layer of soft lymph, smoothly deposited over all parts of their inner surface, and perforated by many apertures, through which the ulcerated bronchi abruptly open. *Presented by James Paget, Esq.*

299 B. Sections of a mesenteric gland, in which the natural texture is replaced by a hard mass of earthy matter. The form of the gland is preserved; and its fibro-cellular capsule, as well as the peritoneum covering it, appears healthy.

From a patient who died with phthisis. The gland had probably been the seat of tuberculous infiltration.

300. "Scrofulous tubercles on the legs of sparrows."—*Hunterian MS. Catalogue.*

301. A lark with a small oval cyst, containing a soft tuberculous (?) substance, on the upper part of each of its wings. *Hunterian.*

Specimens of Tuberculous Disease in other parts of the Museum:*—
In bones, 854-5, 928, 989.
In the peritoneum, 1123? 1124? 1125 to 1130.
„ intestines, 1227 to 1233.
„ liver, 1412 to 1415.
„ lymphatic vessels and glands, 1474 to 1477.
„ heart, 1532-3?
„ lungs, 1797 to 1811.
„ larynx, 1860 to 1863, 1864?
„ kidney, 1913 to 1920.
„ urinary bladder, 2010.
„ brain, 2079 to 2083.
„ membranes of the brain, 2142?
„ testicle, 2418 to 2429.
„ epididymis, 2452 to 2454.
„ vesiculæ seminales, 2472?
„ prostate, 2514? 2515?

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* See the references to the specimens of scrofulous disease at p. 61.

Series VI.—Sub-Series A.—*Tumours of Uncertain Nature.*

301 A. "A tumour from under the lower jaw" [*Hunterian MS. Catalogue*], which may be an example of a true *erectile tumour*.* The cut surface of the tumour displays a close network of fine smooth shining bands and cords, almost exactly like that of the corpus cavernosum penis, only less regular in their arrangement. The exterior of the tumour is uneven, and has no definite character. *Hunterian.*

302. Sections of an oval tumour, together with a large portion of one of the flexor muscles of the thigh, removed from a stump. The tumour, which in its general appearance resembles the firm oval tumours found in nerves, was situated close to the tuber ischii. "It was covered by a thin white capsule; and in compactness, toughness, and consistence, it approached to the characters of scirrhus." *Presented by William Lawrence, Esq.*

The case of the patient is thus related by Mr. Lawrence in the 'Medico-Chirurgical Transactions,' vol. xvii. p. 31. London, 1832:—

"A tumour appeared spontaneously, and increased rather rapidly, in the left thigh of a gentleman twenty-seven years of age. He consulted one of the most eminent surgeons in London, who said that the limb must be removed; and a day was fixed for the operation. When the surgeon came, he was alarmed by the local and general symptoms, and determined not to proceed until a consultation should have been held on the case. The four most experienced and celebrated surgical practitioners of the period were unanimous in considering the affection malignant, and that an operation would not be justifiable. The patient returned to his residence in the country in the situation of a man condemned to death. Anxious however to take any chance of escaping, however slight, he determined to take the opinions of Sir William Blizard and myself before he abandoned himself to his fate; and we visited him together. We found him with a tumour of elastic feel, undefined in its circumference, about four inches in diameter, with the skin shining and bright red, on the anterior and inner part of the left thigh, a little above the knee. There was a firm indolent swelling, about as large as a hen's egg, imbedded in the soft parts at the back of the pelvis, and a similar one in the back near the spine, one as large as a nut over the left eye, and several smaller ones just under the skin in various parts. All the smaller productions had shown themselves subsequently to the appearance of the large tumour in the thigh. The patient was almost worn out by pain and want of rest; he was excessively emaciated with profuse fœtid perspiration. I considered the case quite hopeless, not only from the multiplication of the external swellings, but also from the probability that disease had occurred in internal organs. To Sir W. Blizard it appeared in a light rather less unfavourable: he thought there was a chance of success from amputation, and he performed the operation two days afterwards (March, 1819). This was half a year after the first appearance of the swelling. The more serious and distressing symptoms were immediately relieved, and the patient eventually recovered.* The tumour in the eyebrow, which had increased and become painful, was removed in 1825. In December, 1828, I was consulted by this gentleman on account of a tumour in the fore-arm as large as a walnut, situated over the course of the ulnar nerve, and causing severe pain with indescribable sensations, like electric shocks, upwards and downwards in the direction of that nerve. He had enjoyed tolerable health, without being strong. At this time he was nervous and irritable, with an anxious countenance and an aged appearance. I removed the disease in February, 1829: it was situated between the flexor carpi ulnaris and the bone, and the nerve adhered so closely to it that a portion was removed with the tumour. The latter was of firm texture, but not so hard as scirrhus. [It is preserved in No. 2184.] The part healed favourably, and remains well. The patient again came to me in December, 1830, on account of a tumour, the size of a goose egg, imbedded in the flesh of the stump. He had not been aware of its existence when the last operation was performed; and it had become troublesome only during the preceding six weeks. He now experienced most severe shooting pains in the part, with repeated recurrence of the electric dartings from the stump into the body. I removed the tumour, finding it necessary to make a large incision on account of its size and its deep situation. The growth, although it had been loose and felt circumscribed, appeared to be prolonged to the tuber ischii, and I removed it up to the bone. The part removed [and preserved in No. 302] consisted of a circumscribed oval tumour, and of a firm fibrous prolongation connected to it externally, and consisting of one of the flexors of the knee, which had been divided in the amputation, converted into a tough fibrous texture of light brown tint. The swelling was covered with a thin white capsule, and was homogeneous: in compactness, toughness, and colour, it approached to the character of scirrhus. The extensive wound of this operation healed without any unfavourable occurrence.

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* Many nævi, and some examples of the more vascular kinds of medullary tumours, are liable to variations of form according to the varying degrees of fulness of their blood-vessels, and probably such as these have been described as erectile tumours; but there may be also a species of tumour different from both these, and presenting, as the specimen described above does, a close resemblance to the structure of erectile tissue.

"The pelvic and dorsal tumours remain nearly as they were twelve years ago. Several small subcutaneous knots can be felt in the arms and head, by passing the hand firmly over the surface; but they are less than when the thigh was amputated. There are a few small softish cutaneous growths in the face. The appetite, health, and strength are tolerably good; but there is of late increase of suffering. Strange sensations, sudden dartings and shootings occasioning convulsive movements, and compared to the effects of electricity, are often experienced."

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* Part of the sciatic nerve, removed from the amputated limb, is preserved in No. 2183. It presents numerous swellings, like ganglia, formed of fibro-cellular tissue, and investing its filaments.

At the present time (1846) the patient remains in tolerably good health, and is able to discharge his duty as a clergyman. All the tumours referred to in the latter part of the foregoing case are stationary: they are attended by the same kind of pain, but it is less now than formerly. Recently a tumour has appeared within the abdomen in the right iliac and lumbar region.

302 A. Section of the lower part of a femur, on the posterior and inner margin of which a small *fungous* tumour is seated about three inches from the lower edge of the internal condyle. It has an elongated form; its surface is nodulated, fissured, and wart-like; its texture is soft, and, when recent, resembled tallow congealed after having been melted. The whole of the femur is rather enlarged; its periosteum is thickened; and there is a large empty cavity in its cancellous texture.

The patient was a man forty years old, who had had necrosis of this part of the femur two or three years previously. The ulcers in the ham connected with the diseased bone had healed after exfoliation; but they re-opened, the tumour shown in the preparation protruded through the integuments, and such profuse hæmorrhages took place from it that the removal of the limb became necessary. The patient recovered after the amputation.

From the Museum of Robert Liston, Esq.

302 B. Portions of bone separated by exfoliation from the femur last described.

303. A small subcutaneous tumour of spongy texture; perhaps a nævus. *Hunterian.*

304. A pale firm tumour, deeply lobulated, and covered by a thin capsule of cellular tissue. *Hunterian.*

305. " A larger tumour, with bone in different parts of it."—*Hunterian MS. Catalogue.*

306. " A tumour from the belly of an ostrich" (*Hunterian MS. Catalogue*). It is a considerable mass of small round nodules, of a brownish firm substance, united by fibro-cellular tissue.

307. The head and neck of a goose, with a large tumour attached near the angle of the lower jaw, on the right side. The tumour is composed of a pale firm substance, and has large vessels on its surface and in the partitions between its lobes. *Hunterian.*

307 A. Sections of a tumour removed from the back. *Hunterian.*

SERIES VI.—Appendix B.—*Tumours or Growths, pendulous or loose, in the closed Cavities of the Body.*

"In the course of his experiments and observations, instituted with a view to establish a living principle in the blood, Mr. Hunter was naturally induced to attend to the phenomena which took place when that fluid was extravasated, whether in consequence of accidental violence, or other circumstances. The first change which took place he found to be coagulation; and the coagulum thus formed, if in contact with living parts, did not produce an irritation similar to extraneous matter, nor was it absorbed and taken back into the constitution, but in many instances preserved its living principle, and became vascular, receiving branches from the neighbouring blood-vessels for its support. It afterwards underwent changes, rendering it similar to the parts to which it was attached, and which supplied it with nourishment.

"In attending to cases of this kind, he found that where a coagulum adhered to a surface which varied its position, adapting it to the motions of some other part, the attachment was necessarily diminished by the friction, rendering it in some instances pendulous, and in others breaking it off entirely. To illustrate this by an example, I shall mention an instance which occurred in the examination of a dead body. The cavity of the abdomen was opened to examine the state of its contents, and there appeared lying upon the peritoneum a small portion of red blood, recently coagulated: this, upon examination, was found connected to the surface upon which it had been deposited, by an attachment half an inch long, and this neck had been formed before the coagulum had lost its red colour. This steeped in water, so as to become white, appeared like a pendulous tumour.

"From this case it became easy to explain the mode in which those pendulous bodies are formed, that sometimes occur attached to the inside of circumscribed cavities; and the principle being established, it became equally easy for Mr. Hunter to apply it under other circumstances, since it is evident, from a known law in the animal œconomy, that extravasated blood, when rendered an organized part of the body, can assume the nature of the parts into which it is effused; and consequently the same coagulum which in the abdomen formed a soft tumour, when situated on a bone, or in the neighbourhood of a bone, forms more commonly a hard one. The cartilages found in the knee-joint, therefore, appeared to him to originate from a deposit of coagulated blood upon the end of one of the bones, which had acquired the nature of cartilage, and had afterwards been separated. This opinion was further confirmed by the examination of joints which had been violently strained, or otherwise injured, where the patients had died at different periods after the accident. In some of these were small projecting parts preternaturally formed, as hard as cartilage, and so situated as to be readily knocked off by any sudden or violent motion of the joint."[*]

308. "A small coagulum of blood attached by a small neck to the peritoneum, near the fixture of the broad ligament of the liver to the abdomen. When recent, before steeped in water, it had all the appearance of a coagulum of red blood, as if it had coagulated as it oozed out of the mouth of the vessel, somewhat like gum coming out of a tree. This I conceive would have become vascular, scirrhous, probably bony, and might have detached itself by some violence, becoming loose, as the above;" [alluding to No. 314.]—*Hunterian MS. Catalogue.*

309. An apparently similar growth attached to the Fallopian tube of a calf. *Hunterian.*

310. Section of a small round flattened tumour, attached by a small pedicle to the interior of the abdomen of an ox. *Hunterian.*

311. The other section of the same tumour. *Hunterian.*

312. A small round fatty tumour, attached by a short narrow pedicle to the omentum of an ox. *Hunterian.*

313. Sections of a small round tumour, found loose in the cavity of the abdomen of a lion. It consists of a pale firm substance, nearly like fibro-cartilage, enclosed in a thin capsule. *Hunterian.*

314. Sections of a small flattened oval tumour, found loose in the abdomen of the gentleman from whom the enlarged spleen (No. 1480) was taken. Like that last described, it is of firm, apparently fibrous, texture; and is enclosed in a thin smooth capsule, the exterior of which is polished like peritoneum. *Hunterian.*

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[*] Extracted from 'Some Observations on the loose Cartilages found in Joints; . . . . . by Sir Everard Home, Bart., from materials furnished by Mr. Hunter:' in the Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. i. p. 229, 1793; and in Hunter's Works, vol. iii. p. 625.

315. A similar specimen; but its substance appears softer, and the capsule is rather thicker. *Hunterian.*

316. "A small tumour, with bone in its centre" (*Hunterian MS. Catalogue*); probably a loose body, partially ossified, from a serous cavity.

317. A small, flat, oval portion of cartilage, removed from an enlarged bursa. *Hunterian.*

318. Sections of a round, flat, and uniformly smooth mass of cartilage, extracted from a knee-joint. *Hunterian.*

319. A similar cartilage, of the shape of the patella, and nearly as large, removed from a knee-joint. At one of its borders it is uneven and broken, as if it had been forcibly torn from a narrow attachment to the wall of the joint. *Presented by Sir Everard Home.*

320. Numerous portions of cartilaginous substance from the cavity of a false joint formed after an ununited fracture of a humerus.

A large number of similar substances from the same cavity are preserved in No. 470; with the description of which, also, the history of the case is recorded. *Hunterian.*

Specimens of Pendulous and Loose Growths in other parts of the Museum:—
In bursæ, 369 to 376.
" false joints, 467, 469, 470.
" joints, 953 to 957.
" the peritoneal cavity, 2673-4-5-7-8.
" tunica vaginalis, 2326, 2352, 2367 to 2370, 2442 to 2449.

END OF VOL. I.

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